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Vol. XXV, No. 4 APRIL, 1936

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

TRADE MARK

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THE 84th ANNUAL MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION WILL BE HELD IN DALLAS, TEXAS, AUGUST 24–29, 1936. Hotel Adolphus, Headquarters.

Local Secretary, Walter D. Adams, Forney, Texas.

The 1936 Meetings of the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy, Conference of Pharmaceutical Association Secretaries, of the Pharmaceutical Law Enforcement Officials and the Plant Science Seminar will also be held in Dallas, Texas.

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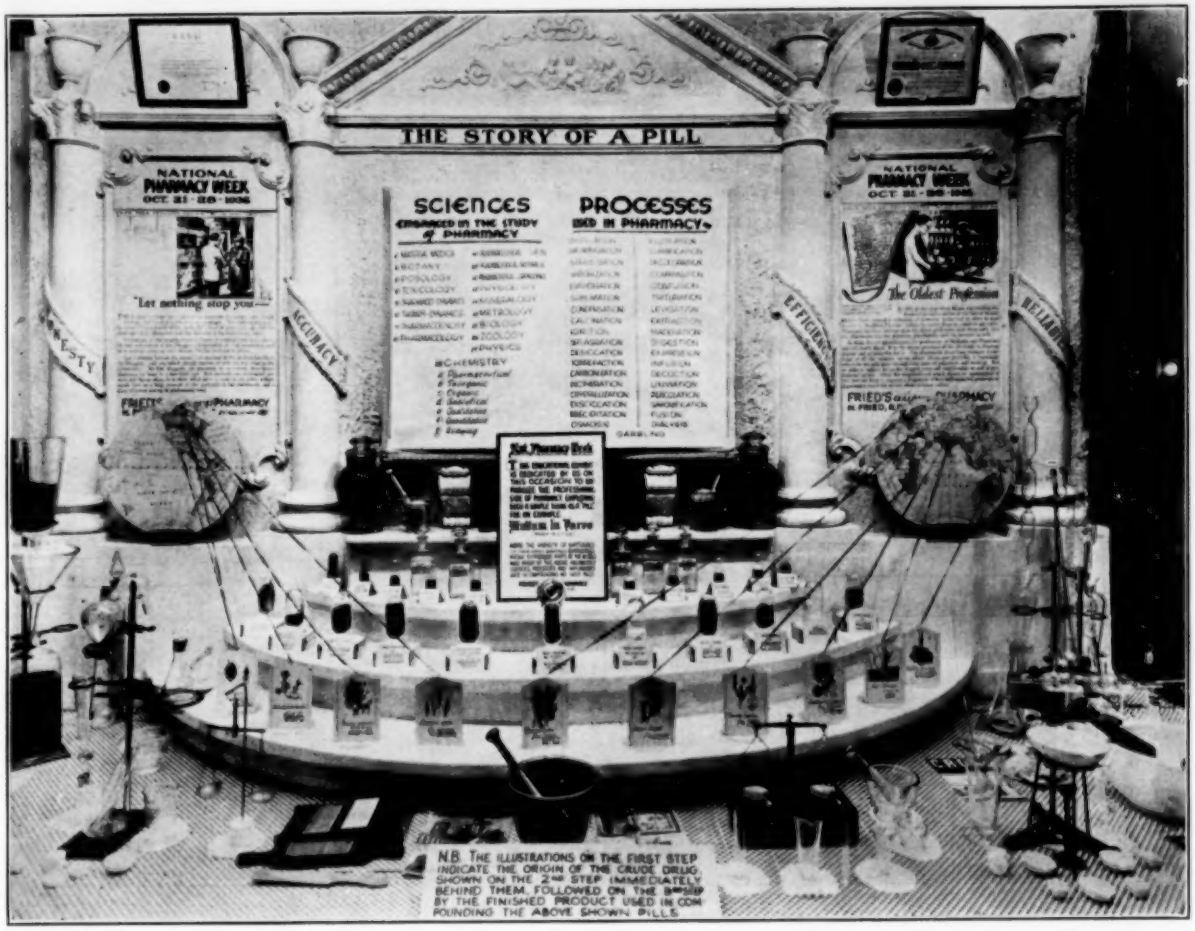
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ROY BIRD COOK.

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. XXV APRIL, 1936 No. 4

THE CHAIRMAN OF THE HOUSE OF DELEGATES, AMERICAN PHARMACEUTICAL ASSOCIATION.

Although not essential, among the helpful and important qualifications of a chairman of the House of Delegates of the AMERICAN PHARMACEUTICAL ASSOCIATION are: The interest he has in his state organization and its activities in the pharmaceutical conferences of law and state bodies; in the work of the State board of pharmacy and participation in that of the National Association of Boards of Pharmacy. In all of these efforts the Chairman of the House of Delegates measures up to a high standard and in recent years his coöperation in the advancement of the AMERICAN PHARMACEUTICAL ASSOCIATION has become influential and valuable.

The West Virginia Review of September 1935 and "Who's Who in America" for 1934–1935, have been drawn upon for data in preparing this brief sketch.

Roy Bird Cook was born April 1, 1886, in Lewis County, near Weston, W. Va., the son of David Bird and Dora Elizabeth (Conrad) Cook. He graduated from Weston High School in 1904. His father was editor of *The Independent*, Weston, and here the son (Roy) was employed for a time, until 1899, when he engaged with Ralston & Bare who encouraged him in his studies and, in 1905, he passed the examination of West Virginia Board of Pharmacy as "registered pharmacist." In 1907, he entered the drug business under the firm name of Ralston & Cook; three years later, he moved to Huntington and continued the pharmacy until 1919; since that time he has been connected with drug stores in Charleston and is president of Older-Cook Drug Company.

Mr. Cook was appointed a member of the West Virginia Board of Pharmacy, in 1925, and since then re-appointed by succeeding Governors, and has been secretary of the Board for the past four years.

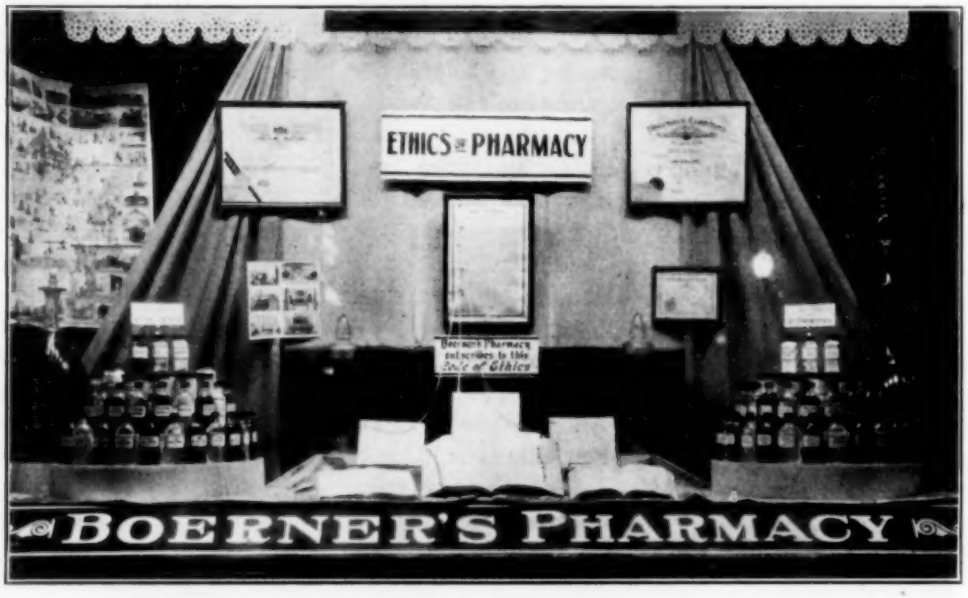
In 1918, he was chosen president of West Virginia Pharmaceutical Association. He was elected Chairman of the House of Delegates, A. PH. A. at the Portland, Ore., meeting and, recently, was appointed member and chairman of the Committee on Proprietary Medicines.

Mr. Cook is a member of the Keller-Cook Company, of Huntington, and treasurer of Kreig, Wallace & McQuaide of Charleston. He is associate editor of *the West Virginia Review* and of the *Weston Independent;* secretary and treasurer of the Independent Publishing Company; S. A. R., Virginia Historical Society. He is author of "The Family and Early Life of Stonewall Jackson," "Lewis County in the Civil War," "Lewis County in the Spanish-American War," "Washington's Western Lands and the Annals of Fort Lee," just off the press.

The West Virginia Review writes of him as "a forceful speaker—a man who stands up and talks sincerely, accurately and interestingly. The biggest job and the most successful one Mr. Cook has accomplished in his life is that of making friends."

He is a former president of the local Kiwanis Club, active in Masonic bodies and as a church member, interested and informed on historical matters.

In 1907, the subject of this brief sketch and Nelle Williams Camden, of Parkersburg, were married; three daughters have graced the family circle—Betty Keith, Eleanor Bird and Mary Randolph (Mrs. B. Haller).



Boerner's Pharmacy Week Window.

THE 1936 REMINGTON MEDAL.

Secretary Hugo H. Schaefer, of the Remington Medal Committee, has announced that the Remington Honor Medal, bestowed annually for meritorious work in American Pharmacy has this year been awarded to E. N. Gathercoal of Chicago.

The Committee of Award, consisting of the past-presidents of the AMERICAN PHARMACEUTICAL ASSOCIATION has selected Professor Gathercoal as recipient because of: the great service that he has given to Pharmacy as chairman of the Committee on Unofficial Formulas and the National Formulary and other extensive investigative work in promoting better standards for pharmaceutical products and because of his efforts to bring about the standardization of color nomenclature. In addition, his useful work in the survey of prescriptions and his researches in pharmacognosy and his continuous record of many years of faithful service as teacher of pharmacy students was recognized.

EDITORIAL

E. G. EBERLE, EDITOR 2215 Constitution Ave., WASHINGTON, D. C.

JOHN URI LLOYD.

THOSE who have had the privilege of knowing John Uri Lloyd will remember him not only for his accomplishments in pharmacy and his contributions to science and literature, but as a man of great humanitarian spirit. He was greatly interested in his fellow men and labored for them. Longevity was an incident to his service; to him life was worth living only so long as he might do useful work. On his 79th birthday he said: "By work I keep young and to my last day I shall stay young; I shall go away—young."[1] When asked on his 84th birthday what he considered the most important thing in life, science, education, religion, art, he said, "No, to have a good time; that is important."

Sunday, April 19th, marks the 87th anniversary of his birth. On his 80th birthday the "Lloyd Clasp" was instituted to serve as a reminder of his unusual devotion to humanity and pharmacy, which had been enriched by his life. The purpose of this comment is to suggest that others pay brief tribute to Professor Lloyd in succeeding issues of the JOURNAL and on other occasions to speak at greater length of him who was with us for many years, so that the historical records may be added to and keep alive his memory.

An editorial of the *Cincinnati Enquirer* speaks of him as scientist, author, humanitarian and gracious neighbor. . . . . His precocious skill in pharmacy developed into a genuine talent for chemistry and his zest for life was transmitted to the printed pages of his "Stringtown on the Pike" with a richness of flavor that made him a man of unusual literary attainments.

When "Etidorhpa" was published, critics everywhere hailed it as one of the classics of the age. The *New York World* said, " 'Etidorhpa' is in all respects the worthiest presentation of occult teaching under the guise of fiction that has yet been written."

He always acknowledged himself debtor to his profession and continued to discharge that debt.

PAN-AMERICAN HEALTH EXPERTS AND THE SPANISH TRANSLATION OF THE U. S. PHARMACOPŒIA.

THE Pan-American health directors, representing Latin America and the United States met in Washington during the week of April 7th. On this occasion phases of the translation of the U. S. Pharmacopœia XI were discussed. The Board of Trustees of the Pharmacopœia held sessions and a meeting was arranged at the AMERICAN INSTITUTE OF PHARMACY.

Among those present at the building, representing the Pan-American delegates and the United States were: Dr. B. J. Lloyd, U. S. Public Health Service and Pan-American Sanitary Bureau; Dr. L. L. Williams, Jr., U. S. Public Health Service and members of the Board of Trustees and of the Committee of Revision of the U. S. Pharmacopœia. Among the representatives of Latin American countries were: Dr. Justo F. Gonzalez, Uruguay; Dr. Enrique Torres Herrera, Colom-

[1] A sketch of the deceased may be found under "Obituary" in this issue of the JOURNAL.

bia; Dr. Emigdio Lola, Nicaragua; Dr. Solon Numez, Costa Rica; Dr. A. A. Moll, Pan-American Sanitary Bureau; Dr. Enrique Lopez-Herrera, Guatemala; Dr. Gregorius Marquez, Pan-American Sanitary Bureau; Dr. W. E. Coutts, Chile; Dr. Arnoldo Gabaldon, Venezuela; Dr. Carlos Monge.

Among the speakers were: President Walter A. Bastedo, of the U. S. Pharmacopœial Convention; Chairman E. Fullerton Cook, U. S. P. Committee of Revision. Dr. Bolivar J. Lloyd spoke on "The Coöperation of the Pan-American Sanitary Bureau in Standardizing Medicines." The subject of Dr. A. A. Moll was: "The Objectives of the Spanish Edition of the U. S. P."

Displays were made of U. S. P. and N. F. preparations and through the courtesy of the Surgeon General's Library a number of Spanish editions, First Edition of the Monardes and Third English Edition of the translation of Nicholas Monardes (1577) were shown. Dr. Emily Walcott Emmart displayed copies of illustrations and text pages of the Badianus Manuscript (see September JOURNAL, 1935).

The delegates entered heartily in the program of the afternoon session.[1] The library of the AMERICAN PHARMACEUTICAL ASSOCIATION was well represented in the display of books.

Dr. Thomas Parran, the new Surgeon General of the Public Health Service, and Dr. Hugh S. Cumming, the retiring officer, participated in the week's sessions; also Director George W. McCoy, of the National Institute of Health, and Assistant Surgeon General J. P. Leake. Other speakers, listed among the visitors, were: Dr. Miguel Sussini, Argentina; Dr. Barros Bareto, Brazil; Dr. Ramos, Cuba; General Siurob and Dr. Bustamante, Mexico; Dr. Monge, Peru; Dr. Lola, Nicaragua, and Dr. Gonzales, Uruguay. These sessions with representatives of our neighbors to the South are worth-while efforts.

FEDERAL FOOD AND DRUGS ACT.

THERE is possibility of the Copeland Bill becoming a law before the close of Congress. It is understood that the President has requested that the bill be placed on the "must" list for legislative action; Hon. Sam Rayburn, of Texas, is chairman of the House Interstate and Foreign Commerce Committee, having the measure in charge.

Intensive work has begun on revision of the bill in efforts to strengthen the weak spots to insure greater protection for the consumer and at the same time modify to some extent the industrial application of some of the sections. "Outstanding among the amendments," it is said, "the committee considers the creation of an administrative board, which has as a purpose the protection of legitimate advertising." Another change would require the Secretary of Agriculture to divide equally with a manufacturer a sample of a product taken for analysis.

The chairman of the sub-committee, Congressman Virgil Chapman, has arranged for sessions to study the proposed revisions.

[1] Further references will be made elsewhere in this issue of the JOURNAL.

SCIENTIFIC SECTION

BOARD OF REVIEW OF PAPERS.—*Chairman*, F. E. Bibbins; Glenn L. Jenkins, John C Krantz, Jr., Heber W. Youngken, L. W. Rowe, L. W. Rising, C. O. Lee, E. V. Lynn, W G. Crockett, Frederick V. Lofgren.

STUDIES ON THE DETERMINATION OF CAMPHOR IN CAMPHOR LINIMENT. IV. THE USE OF ANTIOXIDANTS.*

BY CHARLES F. POE.[1]

INTRODUCTION.

A number of methods have been studied and reported by the author with others (1, 2, 3) for the determination of camphor in camphor liniment. One of the objections to the method given in the U. S. P. X is that the cottonseed oil is oxidized during the heating process, and the increase in weight thereby causes considerable error in the determination. It was thought that this defect might be overcome by means of the use of certain antioxidants. The use of organic chemicals as antioxidants was first proposed by Moureu and Dufraisse (4) and has been studied and reported by these authors in a series of publications.

EXPERIMENTAL.

The determination was carried out according to the U. S. P. X method, except that different amounts of antioxidants were added to the weighed samples before heating. Tin dishes were used throughout the investigations.

In order to study the effect of these substances on the cottonseed oil alone, a number of samples of oils were selected. Five-gram samples were weighed out, and different antioxidants were added in varying amounts. The oils with added chemicals were heated in a constant temperature air oven for different periods of time. Similar determinations were made on samples of oil without the antioxidants. The results are given in Table I.

In comparing the gain in weight of the samples having the antioxidants added with those of the oils heated alone, it will be noted that the antioxidants were effective when added in certain amounts. With pyrogallol and *alpha* naphthol, 1 part in 500 or 1 part in 1000 seems to cause the oil to show practically no loss or gain in weight. With hydroquinone, 1 part in 1000 was more efficient, whereas with para-phenylenediamine the optimum amount was 1 part in 500.

The results in Table I indicate that very small amounts of the antioxidants are effective in preventing oxidation in cotton seed oil. Therefore, small amounts of several organic chemicals were used in a series of determinations of camphor in camphor liniment. The samples of liniment were made from different lots of oil. The results are recorded in Table II.

The results listed in Table II indicate that the use of antioxidants offers some promise for the determination of camphor in camphor liniment. Pyrogallol, *alpha* naphthol and hydroquinone seem to be effective in 1 part in 250, whereas para-phenylenediamine was not effective in the experimental amounts.

The procedure of the method may be summarized as follows: Place about 5 Gm. of camphor liniment in a tared dish having a diameter of at least 70 mm., weigh accurately, add either 20 mg. of pyrogallol, *alpha* naphthol or hydroquinone. The sample is heated for 4 hours at 110° C. in a constant temperature air oven, cooled in a desiccator, and weighed. The percentage of camphor is calculated from the loss in weight. Porcelain or tin dishes may be used, but aluminum dishes should not be used (1).

While the results were fairly satisfactory with some of the antioxidants, it seems to the author that the vacuum oven method (3) gives more satisfactory results.

---

* Scientific Section, A. PH. A., Portland meeting, 1935.

[1] University of Colorado, Boulder, Colo.

TABLE I.—CHANGE OF WEIGHT OF OILS WHEN HEATED WITH ANTIOXIDANTS OF 110° C.

Antioxidant Parts.	Sample Number of Oil Used. 7. 2 Hrs.	4 Hrs.	6 Hrs.	8. 2 Hrs.	4 Hrs.	6 Hrs.	9. 2 Hrs.	4 Hrs.	6 Hrs.	12. 2 Hrs.	4 Hrs.	6 Hrs.	Average. 2 Hrs.	4 Hrs.	6 Hrs.
Pyrogallol.															
1:50	−0.30[a]	−0.52	−0.58	−0.22	−0.34	−0.45	−0.38	−0.46	−0.50	−0.45	−0.59	−0.33	−0.34	−0.48	−0.46
1:100	−0.22	−0.26	−0.26	−0.14	−0.14	−0.12	−0.08	−0.26	−0.20	−0.20	−0.26	−0.26	−0.16	−0.23	−0.21
1:500	−0.10	−0.18	−0.10	−0.03	+0.01	+0.11	−0.02	−0.06	−0.04	−0.04	−0.00	+0.10	−0.05	−0.06	+0.02
1:1000	0.00	−0.02	0.00	−0.02	+0.01	+0.02	+0.08	+0.10	+0.14	−0.03	+0.07	+0.21	+0.01	+0.04	+0.09
Alpha Naphthol.															
1:50	−0.10	−0.32	−0.28	−0.27	−0.33	−0.39	−0.50	−0.62	−0.86	−0.52	−0.64	−0.71	−0.35	−0.48	−0.56
1:100	−0.08	−0.22	−0.18	−0.09	−0.14	−0.14	+0.01	−0.10	−0.14	−0.30	−0.36	−0.40	−0.12	−0.21	−0.22
1:500	0.00	−0.02	+0.02	+0.02	+0.08	+0.14	+0.08	+0.09	+0.14	−0.01	+0.04	+0.10	+0.02	+0.05	+0.10
1:1000	0.00	0.00	+0.05	0.00	+0.04	+0.18	0.00	+0.02	+0.06	−0.04	−0.06	+0.10	−0.01	0.00	+0.10
Hydroquinone.															
1:50	−0.51	−0.73	−1.19	−0.48	−0.94	−0.57	−0.76	−0.82	−1.28	−0.74	−0.92	−1.46	−0.62	−0.85	−1.38
1:100	−0.35	−0.63	−0.43	−0.27	−0.48	−0.66	−0.26	−0.54	−0.84	−0.62	−0.83	−1.04	−0.38	−0.62	−0.74
1:500	−0.02	−0.08	−0.05	−0.12	−0.14	−0.09	−0.16	−0.28	−0.32	−0.20	−0.16	−0.00	−0.13	−0.17	−0.12
1:1000	−0.08	−0.14	−0.10	−0.03	−0.06	−0.10	−0.08	−0.08	−0.08	−0.08	+0.08	−0.04	−0.07	−0.09	−0.08
Para-phenylene Diamine.															
1:50	−1.22	−1.28	−1.42	−1.00	−1.08	−1.26	−1.36	−1.48	−1.55	−1.36	−1.36	−1.36	−1.24	−1.30	−1.40
1:100	−0.50	−0.62	−0.70	−0.46	−0.50	−0.50	−0.74	−0.60	−0.50	−0.52	−0.54	−0.52	−0.56	−0.57	−0.56
1:500	+0.04	+0.14	+0.12	0.00	+0.04	+0.10	−0.04	+0.08	+0.20	+0.02	+0.16	+0.26	+0.01	+0.11	+0.17
1:1000	0.00	+0.05	+0.36	−0.02	+0.08	+0.24	+0.05	+0.30	+0.50	+0.10	+0.26	+0.36	+0.03	+0.17	+0.37
Oil alone	+0.44	+0.60	+0.90	+0.16	+0.38	+0.80	+0.36	+0.47	+1.08	+0.52	+0.68	+1.00	+0.37	+0.53	+0.95

[a] All results expressed in per cent.

TABLE II.—DETERMINATION OF CAMPHOR BY USE OF ANTIOXIDANTS.

20 Per cent Liniments Used. 110° C.

Antioxidant Parts.	Sample No. 7. 2 Hrs.	4 Hrs.	6 Hrs.	Sample No. 8. 2 Hrs.	4 Hrs.	6 Hrs.	Sample No. 12. 2 Hrs.	4 Hrs.	6 Hrs.	Average. 2 Hrs.	4 Hrs.	6 Hrs.
Pyrogallol.												
1:250	19.12[a]	19.88	19.92	19.50	19.87	19.73	19.42	19.94	19.90	19.35	19.90	19.85
1:500	18.98	19.92	19.94	18.48	19.70	19.60	19.00	19.80	19.56	18.22	19.81	19.70
Alpha Naphthol.												
1:250	18.30	19.88	19.92	18.54	19.84	19.80	18.75	19.86	19.70	18.53	19.86	19.81
1:500	18.82	19.84	19.90	18.44	19.80	19.65	18.80	19.72	19.52	18.69	19.79	19.70
Hydroquinone.												
1:250	19.60	19.90	19.94	19.60	19.96	20.00	19.00	19.94	19.80	19.40	19.93	19.91
1:500	18.10	20.04	19.99	19.40	19.82	19.50	19.08	19.84	19.54	18.86	19.90	19.68
Para-phenylene Diamine.												
1:250	17.94	19.74	19.68	18.34	19.14	19.08	18.60	19.80	19.67	18.29	19.56	19.48
1:500	19.04	19.95	19.70	18.22	19.28	19.26	18.34	19.56	19.53	18.53	19.60	19.50
No antioxidant	19.50	19.40	19.18	18.60	19.26	19.14	19.62	19.36	19.13	19.24	19.34	19.15

[a] All results expressed in per cent.

CONCLUSION.

1. Certain antioxidants have been investigated for use in the determination of camphor in camphor liniment.

2. Several antioxidants seem to show promise as a means of preventing the oxidation of the cottonseed oil used as a base for camphor liniment.

3. The results obtained with the use of the antioxidants seem to be more satisfactory than the results obtained by means of the U. S. P. X method, but less satisfactory than with the vacuum oven method.

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(3) Poe, C. F., "Studies on the Determination of Camphor in Camphor Liniment. III. Vacuum Oven Method," JOUR. A. PH. A., 21, 337 (1932).

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THE ASSAY OF ORGANIC MEDICINAL PREPARATIONS CONTAINING ARSENIC.*

BY EDWARD J. HUGHES.

During the past thirty years no less than a dozen distinctly different methods have been proposed for the estimation of arsenic in organic medicinals. Yet, up to the present time, no general method having the desirable qualities of accuracy, practical simplicity and rapidity has apparently been evolved.

* Scientific Section, A. PH. A., Portland meeting, 1936.

Splendid work has been done by a number of investigators in developing assay procedures that apply to a given arsenical, or, in some cases, to a group of arsenicals. It is when an attempt is made to apply a given assay method to the ever-increasing list of organic arsenicals that the analytical limitations of the method are discovered. There are also a number of very dependable methods that either require special equipment or are too involved and time-consuming to be acceptable for general use.

It is endeavored, with these thoughts in mind, to draw upon the experiences of other investigators and to develop, if possible, an improved method having the elements of precision and speed, which at the same time might be generally applied by the routine analyst to a relatively large proportion of medicinal arsenicals.

Among the earlier quantitative methods were those in which the arsenic was estimated by difference and others depending upon the increase in weight of a combustion tube after the elementary analysis of the organic arsenical. Later methods involved various types of fusions and distillations which were followed by gravimetric or by volumetric estimation of the arsenic. These earlier methods have been pronounced unreliable, either because of the inexact nature of the procedure, or because of the loss of part of the arsenic through volatilization. Continued investigation has resulted in the development of methods involving the use of the potentiometer and of the Marsh apparatus. One of the more recent methods depends upon the formation of hydrogen arsenide, which is subsequently determined by means of a combination iodometric and acidimetric titration. A very trustworthy although tedious procedure is the one in which the arsenic is oxidized by the Carius method to arsenic acid and subsequently weighed as magnesium pyroarsenate.

The work of Norton and Koch (1) in 1905 has resulted in the development of a procedure which is essentially the basis for most of the methods that are now in general use. These investigators found that moist combustion with sulphuric acid can readily be employed to liberate arsenic from organic matter with no loss of arsenic through volatilization and that the resulting acid-digestion mixture may be used for the quantitative estimation of arsenic, either by immediate titration with standard iodine solution after neutralization, or by gravimetric methods. This general idea of moist combustion or digestion has since been utilized by the following investigators, with the modifications that are indicated:

Investigator.	Year.	Digesting Agents.
Lehmann	1912	$H_2SO_4 + KMnO_4$
Ewins	1916	$H_2SO_4 + K_2SO_4$ + Starch
Rogers	1920	$HNO_3 + (NH_4)_2S_2O_8$
Robertson	1921	$H_2SO_4 + HNO_3$ (fuming)
Newbery	1925	$(NH_4)_2S_2O_8$ Solution
Keimatsu and Wada (2)	1931	$H_2SO_4 + K_2SO_4 + KClO_4$
Kahane	1934	$H_2SO_4 + HClO_4 + HNO_3$

It will be noted that among the above examples only in the Ewins (3) method of digestion is the arsenic reduced. In all other cases the arsenic is oxidized to the pentavalent condition. In the Lehmann (4) and the Rogers (5) methods the

oxidized arsenic is caused to liberate iodine from potassium iodide and is ultimately estimated by back titration with standard sodium thiosulphate. In the other digestions the arsenic is reduced to the trivalent form, if not already in that condition, and is finally estimated by direct titration with standard iodine solution or with standard potassium bromate solution as is the case in the recently developed Kahane (10) method.

DuMez and Myers (6) have demonstrated that the Lehmann method, slightly modified, is best adapted for the rapid routine analysis of arsphenamine and of neoarsphenamine. Our investigation has shown that these workers were correct in their contention, although it is our experience that the indefinite nature of the end-point in the final titration is far from being satisfactory. On the other hand, there are certain organic arsenicals for which the Lehmann method of assay is unsuitable. Ewins brought out this point in 1916 and Robertson (7) made the observation in 1921 when he stated that the Lehmann method of oxidation fails with certain of the refractory arsonic acids.

The failure of the Lehmann procedure to yield consistently accurate results in the assay of carbarsone prompted the authors to look elsewhere for a suitable method of assay. The use of ammonium persulphate in the preliminary digestion, as proposed by Newbery (8), proved to be inadequate. The potentiometric method of Cislak and Hamilton (9), which yielded results that checked closely with the calculated amount, was set aside for the reason that the potentiometer is not always readily available in those laboratories that are not accustomed to making a large number of routine arsenic assays.

One of the latest published methods has been proposed by Kahane. This procedure involves digestion and oxidation with a mixture of nitric, perchloric and sulphuric acids, reduction with hydrazine sulphate and direct titration with standard potassium bromate solution in the presence of an excess of sodium bicarbonate. While this method appears to be rapid and relatively simple, the experience so far leads the authors to believe that it is not sufficiently trustworthy for routine application.

Kahane's rapid method of oxidation with perchloric acid mixture has been utilized, however, in formulating a new method having what appeared to be the more desirable elements of the Robertson and the Ewins procedures. The revised perchloric acid method used in this investigation is as follows:

PERCHLORIC ACID METHOD.

To an accurately weighed sample of about 0.25 Gm., in a Kjeldahl flask, add 5 cc. of a mixture containing 7 parts of sulphuric acid (Sp. Gr. 1.82), 2 parts of perchloric acid (Sp. Gr. 1.61) and 1 part of nitric acid (Sp. Gr. 1.39). Apply moderate heat for ten minutes or more after the first appearance of vapors of sulphuric acid. Cool and deliver directly into the liquid 0.25 Gm. of hydrazine sulphate. Keep this mixture at the boiling point for ten minutes. Cool and wash down the inside of the flask with several portions of distilled water, sufficient to make a total volume of about 125 cc. Boil briskly for about one minute, again wash down the neck of the flask with small portions of distilled water, mix thoroughly and allow the mixture to cool. Add 1.0 Gm. of potassium iodide, boil for five minutes, wash down the neck of the flask, mix and allow to cool. Titrate with just sufficient $N/10$ sodium thiosulphate to exactly discharge the color of any liberated iodine. Make alkaline to litmus with 1:1 sodium hydroxide solution, then acidify with sulphuric acid. Dissolve about 5 Gm. of sodium bicarbonate in the solution and titrate with $N/20$ iodine solution.

A considerable amount of work has been done with the Ewins method in our laboratories with most encouraging results, particularly as it is applied to the assay of sodium cacodylate, arsanilic acid and carbarsone. This method has been criticized because of the prolonged digestion period which is involved and because of the possible loss of arsenic through volatilization. We have obtained scores of results by this method that agree very closely with the calculated amount of arsenic. Although relatively long in total lapsed time, Ewins method appears to have the advantages of simplicity in technique and to yield a relatively sharp end-point in the final titration with standard iodine solution. Following a suggestion made by Dr. Melvin R. Stevinson (11), the authors have undertaken to modify the Ewins method with the idea of hastening the time of digestion and thereby reducing the possibility of losing arsenic through volatilization to a minimum. The details of this modified method are given as follows:

MODIFIED EWINS METHOD.

Accurately weigh about 0.25 Gm. of sample on a tared, arsenic-free cigarette paper. Fold and deliver the paper and contents into a Kjeldahl flask containing 6 Gm. of reagent potassium sulphate and 20 cc. of concentrated sulphuric acid. Carefully digest the mixture until colorless over a free flame. Cool and dilute with 150 cc. of distilled water. Cautiously make alkaline to litmus with 1:1 sodium hydroxide solution, then make slightly acid with sulphuric acid and allow to cool. Add 2 Gm., in excess, of sodium bicarbonate, mix thoroughly and titrate with $N/20$ iodine solution.

In order to determine the relative values of (1) the Lehmann method, as it is now modified in the U. S. P. XI, (2) the original Ewins method, (3) the perchloric acid method and (4) our modification of Ewins method as general assay procedures, each of the methods has been separately applied to a series of representative arsenicals. The results obtained are tabulated as follows:

	Percentage of Arsenic Found.				
Name of Arsenical.	Lehmann Method.	Ewins Method.	Perchloric Acid Method.	Modified Ewins Method.	Percentage of Arsenic Calculated.
Arsphenamine	32.51	30.29	31.01	31.02	31.55
	32.81	30.29	31.91	30.82	
Neoarsphenamine	19.61	18.01	16.93	18.40	Not less
	19.99	18.01	17.23	18.57	than 19
Acetarsone	28.39	27.14	23.10	26.95	27.24
	28.16	27.14	25.81	27.05	
Tryparsamide	25.34	24.01	24.08	24.40	24.57
	25.49	24.16	24.16	24.30	
Carbarsone	28.08	27.74	27.88	27.86	28.82
	27.85	27.74	27.96	28.01	
Sodium cacodylate	1.52	34.59	34.77	34.93	35.01
	1.83	34.74	26.87	34.83	
Arsanilic acid	41.05	34.28	32.06	33.93	34.53
	41.05	34.20	28.45	34.13	
Approximate amount of time for assay	1½ hrs.	3 hrs.	1¼ hrs.	½ to 1¼ hrs.	..

All of the above results have been obtained from the undried samples. The end-points were relatively sharp in the final titrations in all except Lehmann's method,

in which case considerable difficulty was encountered in making correct interpretations. It will be noted that Lehmann's method yields results that are uniformly higher than those obtained by the other methods, except for sodium cacodylate, and that this method appears to be best adapted for the assay of arsphenamine and neoarsphenamine. On the other hand, the Ewins method, the perchloric acid method and the modified Ewins method all appear to give results that agree more closely with the theoretical amounts which would indicate that the higher figures obtained by Lehmann's method may be due to the nature of the method itself rather than to any loss of arsenic through volatilization in the three other methods.

In conclusion, our experience would indicate that the Ewins method is definitely superior for the assay of arsanilic acid, sodium cacodylate and carbarsone. The substitution of an arsenic-free cigarette paper in place of starch in the digestion mixture makes the Ewins method considerably more rapid, without apparently affecting its accuracy.

The author wishes to acknowledge the valuable assistance received from E. J. Kirkpatrick, F. A. Whipple and R. M. Lingle in preparing this paper.

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DIALKYLAMINO ACETYL UREAS.*

BY T. C. DANIELS.[1]

There are two general types of ureas that have found relatively wide application as hypnotics, the brominated acyl ureas (Bromural, Adalin) and the cyclic ureids of the barbital type.

An examination of the literature revealed that the dialkylamino acetyl ureids have not been examined and it was decided to prepare the following substances for study: Diethyl, di-*n*-propyl, di-*n*-butyl, di-iso-butyl, di-*n*-amyl, and di-iso-amylamino acetyl ureas.

EXPERIMENTAL.

Bromacetyl urea was prepared by reacting 75 Gm. of urea (xs) with 224 Gm. of bromacetyl bromide. The acyl halide was added slowly with stirring to the urea. The reaction product first melts, then solidifies, and the reaction mass after heating on a water-bath for forty-five minutes

* Scientific Section, A. PH. A., Portland meeting, 1936.

[1] University of California, College of Pharmacy.

is allowed to stand over night. The mass is then washed with a saturated solution of sodium bicarbonate and crystallized from 50% alcohol. The dried product melts with decomposition at 164° C. Baeyer[1] has prepared this compound in the same manner.

The dialkylamino derivatives were prepared by reacting the appropriate dialkylamine in excess (5%) with the bromoacetyl urea. Upon slight warming the reaction starts and soon melts, then solidifies. The mass is finally heated for two to three hours on a boiling water-bath to complete the reaction. The hard mass is then broken up in a mortar and extracted with ether followed by thorough washing with a saturated sodium bicarbonate solution. The product is then crystallized from a hot solution of 30% alcohol. The compounds were obtained in yields varying from 40% to 78%.

		Nitrogen Found.	Nitrogen Theoretical.	M. p. ° C.
1.	Diethylamino acetyl urea	24.1%	24.27	102
2.	Di-*n*-propylamino acetyl urea	20.7	20.89	123
3.	Di-*n*-butylamino acetyl urea	18.3	18.34	122
4.	Di-iso-butylamino acetyl urea	18.3	18.34	68
5.	Di-*n*-amylamino acetyl urea	16.2	16.34	97
6.	Di-iso-amylamino acetyl urea	16.2	16.34	99

The compounds were tested in the pharmacological laboratory of the Medical School and found to possess no hypnotic properties.

A study of the solubilities showed the compounds hydrolyze comparatively readily even at room temperature. It was therefore not possible to study their distribution. This hydrolysis may possibly account for their pharmacological inactivity.

SUMMARY.

The following new compounds have been prepared and studied: diethylamino, di-*n*-propylamino, di-*n*-butylamino, di-iso-butylamino, di-*n*-amylamino and di-iso-amylamino, acetyl ureas.

ACKNOWLEDGMENT.

The writer is grateful to Dr. C. D. Leake of the Medical School for the pharmacological testing of these compounds.

THE DETERMINATION OF FREE ALKALI IN SOFT SOAP.*

BY ROBERT M. LINGLE.

While attempting to accurately determine the amount of free alkali in soft soap the author has constantly observed wide discrepancies in following the U. S. P. method and by employing a direct titration method in which the use of a filter is omitted. The alkalinity figure in the direct titration procedure in the presence of neutral ethyl alcohol is invariably higher than is obtained according to the U. S. P. method. It has also been observed that when phenolphthalein indicator is added to the alcoholic solution, the resulting alkaline color either becomes fainter or disappears when passed through a filter.

These observations prompted a search of the literature to determine if the method which is official in the U. S. P. is the best procedure that has been devised,

[1] Baeyer, A., 130, 156 (1864).

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and to learn if an excessive amount of free alkali is being permitted by the official standard.

A reference by Simmons (1) was found to suggest that all soaps except the lowest grade household soaps should be practically free from caustic soda or potash. Oculus (2) states that a content of 0.08 per cent sodium hydroxide may cause irritation when applied to a sensitive skin.

In an effort to trace the origin of the official procedure for determining free alkali in soft soap three basic methods have been described in the literature. Briefly, these methods are indicated as follows:

1. Barium chloride precipitation method.
2. Salting-out method.
3. Alcohol solubility method.

The first method, in which barium chloride is used to separate the carbonates, stearates, oleates, etc., was devised by Herrmann (3) and (7). It is given official recognition in the British Pharmacopœia. The writer attempted to apply this procedure to several samples of soft soap and found difficulty in making a satisfactory separation either by filtering, decanting or by the use of the centrifuge.

Poethke (4), Kling, Genin and Florentin (5) and Bosshard and Huggenberg (6) and (8) investigated the barium chloride precipitation method and found many objections to its use.

The salting out method was the object of considerable study by Dietrich (9), Newington (10), Davidsohn (11) and (12), Bergell (13), Knigge (14), Schuttig (15) and Banninger (16) with the result that many sources of error were found.

Hope (17) devised the third basic method, known as the alcoholic solubility method. This has been investigated very thoroughly by Bosshard and Huggenberg (6), Izmailski (18), Newington (10), Simmons (19), G. Knigge (20), Schutte (21), Divine (22), Dudley and Pease (23), Lewkowitsch (24), Allen (25), U. S. Bureau of Standards (26) and Hurst (27). Most of these investigators found sources of errors in using this method.

At the present time, therefore, no method appears to have been devised which, on close scrutiny, does not yield some source of error. The alcohol method of the U. S. P. is in slight error for the reason that a small amount of atmospheric carbon dioxide is absorbed during the manipulation, and traces of alkali carbonates and silicates are dissolved in the alcohol. However, it seems that the degree of deviation from the true result is so slight as to be almost negligible when the nature of the product is considered.

There is also the problem as to whether some of the free alkali existing in the soap at the time of manufacture is gradually neutralized by the fatty acids, so that after several months a soap which originally contained 0.25 per cent free alkali becomes practically neutral. Experiments are now being conducted in order to obtain some information concerning this problem.

The author is grateful to E. J. Hughes for his many helpful and valuable suggestions.

SUMMARY.

1. A number of references are cited to show that the present U. S. P. allows more free alkali in soft soap than is desirable in a soap which is intended for medicinal use.

2. An examination of the literature has been made for the purpose of studying the various methods that are described for the determination of free alkalinity in soft soap.

3. Objections have been found to all of the available methods, although the procedure of the U. S. P. is more rapid, more convenient to use, and gives results which are sufficiently accurate for the nature of the product.

4. Experiments are being conducted to determine whether some of the free alkali is gradually neutralized by the fatty acids in the soap.

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A NEW GLUCOSIDE FROM BLUEBERRY LEAF.*

BY N. KENNETH EDGARS.

The use of blueberry leaves or extracts made therefrom as a remedy for diabetes is not new to medicine. Wagner (1) in 1925 and Allen (2) in 1927 both experimented with extracts and concentrates made from these leaves and proved that at least one hypoglycemic, or blood sugar lowering, substance exists and can be extracted in a stable form. Their product, which was named Myrtillin erroneously, is an example of such an extract. It was not pure enough to give uniform results, but its discovery marked an important step in the history of the pharmacology of this plant. The name Myrtillin properly belongs to a galactoside which exists in the fruit of this genus and discovered by Willstätter in 1915 (3).

* New Era, Pharmaceutical Laboratory, Inc., Tenafly, N. J.

A new glucoside $C_{24}H_{36}O_{18}$, named Neomyrtillin, was first isolated and analyzed in 1929, but not placed in its proper chemical sequence until late in 1933. Neomyrtillin is the therapeutically active principle of blueberry leaves, having the distinct advantage over insulin of being effective as a hypoglycemic agent when administered by mouth.

The varieties of blueberry yielding the largest leaves are more important for the purposes here described. The "high bush" blueberry species have been found to have more leaf area per bush than the "low bush" species. Therefore only a brief botanical description of *Vaccinium corymbosum*, the most common "high bush" blueberry indigenous to New England and the east central states, wherein the bulk of all our commercial blueberries are found, will be attempted here.

A perennial shrub from one to three meters high, with numerous main stems originating from a common root stock. Main stems and secondaries both very much twisted and striated, from gray to brown in color. Leaves are ovate, 3 cm. wide by 7 cm. long, margin entire, both apex and base blunt, very short petiole and axillary bud. Texture herbaceous, from smooth to glabrous on the upper surface, lower surface much lighter in shade and pubescent. Leaves are alternate with internodes 2 or 3 cm. long. Flowers appear early in May as terminal or lateral clusters; the inflorescence generally assuming the corymbose shape; corolla oval-cylindraceous, dull white, 5-toothed, 8 mm. long by 5 mm. wide; calyx 5-lobed, saucer shaped; stamens 10, 6 mm. long, with whitish, hairy filaments and long, pointed or awned, amber-colored anthers, introrsely attached, which dehisce by terminal chinks. Fruit dark, blue-black spheres, 8 mm. across, soft, sweet and covered with a fine down of hairs. The interior consists of 5 cells, each partly divided by false partitions growing inward toward the placentæ.

The leaves are gathered in mid-summer and dried in special frames protected from direct sunlight. When so dried, they do not turn brown, but assume a dull, olive-green color. They are then transferred to a mill and reduced to powder, which is treated with volatile solvents in special extractors to remove wax, resins and chlorophyll. The marc is extracted with acidified methyl alcohol; the extract dried and placed in a Tannin Extracting Apparatus which removes tannins and non-specific proteins. The solute contains the Neomyrtillin, which is removed by precipitation with a carefully normalized and buffered solution of caustic soda and purified by washing first with ethyl alcohol and then with ether.

A proximate analysis of the air-dried and powdered blueberry leaf was made, using appropriate solvents for the several fractions. Standard methods were used whenever possible, otherwise original processes were devised. The fresh leaves lost 62% water in desiccator. The total ash of the air-dried leaf was 3.62%, of which 0.29% was acid-insoluble.

(Air-Dried Leaf.)

Moisture	8.58%	Water extract, sol. in alcohol and ether probably decomposition products (xanthophyll)	13.32%
Tannins	8.38%		
Chlorophyll	3.42%		
Wax, resin	3.55%		
Gum, mucin	5.10%	Crude fibre	12.72%
Carbohydrate	11.65%	Marc	30.80%
Neomyrtillin	2.00%		

Neomyrtillin obtained by the above process was a dull brown, amorphous powder with a slight alœ-like odor and a sweet astringent taste. It was not very soluble in cold water or alcohol but very soluble in both solvents when warmed slightly, yielding deep, red-brown solutions. An aqueous solution (1:100) was distinctly acid to methyl orange and, like most glucosides, was lævorotatory $-$ $[\alpha]_D = -0.7$ (1:1000 H_2O). The melting point was 57° C. When hydrolyzed with zymase, the compound broke down into its component parts, among which glucose and tri-hydroxy benzoic acid were identified by standard qualitative tests (4).

Combustion analyses and molecular weight determinations both by freezing and boiling point methods (Beckmann), showed the molecular formula to be $C_{24}H_{28}O_{15}$. The compound responded to many of the reactions of galloyl glucose as described by Fischer, Bergmann, *et al.* (5) and yielded about 17% methoxyl groups in the Zeisel Reaction (4). Insoluble compounds were obtained with the salts and oxides of lead and mercury and with most alkaloids.

The compound would seem therefore to be a methoxygalloyl-glucose. As gallic acid is liberated on hydrolysis, it may be assumed that the methoxyl groups are attached to the glucose itself rather than to the galloyl side chain.

Tests for identity were devised, among which were the following: To 10 cc. solution of Neomyrtillin in water (1:100) add 5 to 10 drops of ferric chloride T.S. A greenish black color is produced, which changes to a reddish brown precipitate on the addition of 2 cc. ammonium hydroxide T.S.

Dissolve 0.5 Gm. Neomyrtillin in 25 cc. warm distilled water and mix with 5 Gm. ferric oxide in a mortar. Let stand for 20 minutes, filter and add 3 drops of $N/10$ NaOH to the filtrate. Evaporate the filtrate on a watch glass at 100° C. almost to dryness and set aside to dry in a warm closet. Examine under a microscope (x250). Long, colorless, or slightly yellow, polygonal, acicular crystals and similarly colored, characteristically shaped, stellar rosettes are present in large amounts (4).

Tests for purity include a modified heavy metals test and a test, devised by the author, for free tannin in the presence of gallates, using the Lamotte Block Comparator to match the colors exactly. In this test, carefully measured quantities of iron tannate (blue), iron gallate (green) and Neomyrtillin-iron are substituted for the colored solutions in the Block Comparator and the absence of free tannin in the sample ascertained colorimetrically. The ash does not exceed 0.05%.

In order to determine the blood sugar diminishing or hypoglycemic power of Neomyrtillin, a series of interesting pharmacological experiments were carried out, using rabbits as test animals. Rabbits are used almost exclusively in blood sugar experimental work because they are easy to handle and are especially responsive to piqûre.

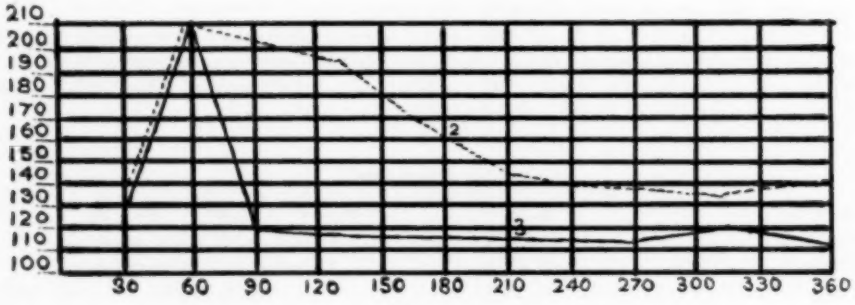

Fig. 1.

Artificial hyperglycemia (diabetes) was induced by the method of piqûre, as devised by Banting (6). This is a painless process in which the nerve center controlling the function of the pancreas is destroyed under anesthesia. The blood sugar level will remain high, usually over 200 mg. per 100 cc., until some hypoglycemic substance like insulin or Neomyrtillin is introduced hypodermically or orally; in which case the level will fall to a little over 100.

Substances to be administered hypodermically were brought as near to neutrality as possible, then sterilized and injected subcutaneously into either subscapu-

lar region or fed orally through a catheter. After a short period of rest and assimilation, blood for analysis was withdrawn from the ear lobe by severing one of the larger veinlets, which bulge on the outer surface, and allowing the blood to drop into a clean crucible containing a small amount of potassium oxalate to prevent coagulation. An exact amount of the oxalated blood was then pipetted from the dish and analyzed according to the method of Folin and Wu (7).

In the appended graph, the blood sugar reading is given at the left, in milligrams for each 100 cc. of blood, and the time in minutes from left to right. Dotted curve Number 2 represents the effect of feeding glucose hypodermically to starved rabbits. Solid line Number 3 shows the effect upon the same rabbits after administering Neomyrtillin hypodermically.

CONCLUSIONS.

1. The entire pharmacology of blueberry leaf has been studied.
2. The glucoside $C_{24}H_{36}O_{16}$ was isolated, purified, studied and the nondescriptive name Neomyrtillin given to it.
3. Neomyrtillin was found to possess hypoglycemic properties when administered to rabbits having induced alimentary hyperglycemia.

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A STUDY OF THE ASSAY OF ACONITE AND THE STABILITY OF ITS PREPARATIONS.*[1]

BY GEO. BAKER[2] AND DEAN CHAS. B. JORDAN.

Aconite, though employed in medicine since the thirteenth century, has never had a completely satisfactory assay. Much confusion existed in the early investigation of the drug. It was not until about 1900 that the alkaloids existing in Aconite were definitely identified and their relative physiological action determined. The eighth revision of the United States Pharmacopœia (U. S. P. VIII) possessed a chemical assay for the drug and its preparations while the ninth revision carried an alternative physiological assay. The tenth revision of the U. S. P. dropped the chemical assay and made the bioassay official. The chemical assay method was unsatisfactory in that it determined total alkaloids. The alkaloids of *Aconitum Napellus* are aconitine, benzoylaconine, and aconine. Aconitine is the active agent and a practical assay must therefore determine the aconitine present in the drug and its preparations.

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* Scientific Section, A. PH. A., Portland meeting, 1935.

[1] Based upon a thesis by Geo. L. Baker submitted to the Faculty of Purdue University in partial fulfilment of the requirements for the degree of Doctor of Philosophy, June 1935. (A fairly complete bibliography accompanies the thesis.)

[2] Eli Lilly & Co. Fellow, 1933–1935.

The purpose of this investigation was to work out a satisfactory chemical assay procedure for Aconite and its preparations and to further check the work of previous investigators on the stabilization of Aconite preparations. Such an assay has been worked out in this laboratory and is presented on the following pages. Work has been carried out on stabilization of the tincture and fluidextract and the determination of any change in p_H during storage of the tincture and fluidextract.

EXPERIMENTAL—PART I.

Stabilization and Changes in p_H of Aconite Preparations.—The studies undertaken are indicated in the title. Two phases were investigated regarding the stability of the official preparations of Aconite. The first of these involved the change in the p_H value of the tincture and fluidextract during storage and this phase will be discussed here.

For this determination tincture and fluidextract of Aconite were obtained from Eli Lilly and Company of Indianapolis, Indiana, and the p_H determined. Samples of 60 cc. each were then stored in the following manner: (*a*) two samples in colorless glass bottles were stored in diffused light, one remaining closed throughout storage and one being opened occasionally to simulate drug store conditions; (*b*) two samples in amber-colored bottles were stored and treated as in (*a*); four samples, two in colorless glass bottles and two in amber-colored bottles, were stored in a dark compartment and treated in the same manner as the samples in diffused light. The hydrogen-ion concentrations of these samples were determined after thirteen months' storage. They were assayed biologically at about the same time. Results are given in the table.

TABLE I.—TINCTURE OF ACONITE, U. S. P. (p_H 4.62 AT 25 DEGREES, 10/19/33).

Sample No.	Color of Bottle.	Conditions of Storage. Light Conditions.	Closed or Open.	p_H at Storage 10/19/33.	p_H after 13 Mos'. Storage 11/14/34.	Bioassay 1/12/35 M. L. D.
I	Amber	Diffused	Closed	4.62	3.53	0.000346 cc.
II	Amber	Diffused	Opened	4.62	3.53	.....
III	Colorless	Diffused	Closed	4.62	3.45	0.00035
IV	Colorless	Diffused	Opened	4.62	3.35	.....
V	Amber	Dark	Closed	4.62	3.35	0.000325
VI	Amber	Dark	Opened	4.62	3.41	.....
VII	Colorless	Dark	Closed	4.62	3.28	0.000346
VIII	Colorless	Dark	Opened	4.62	3.29	.....

In the following table are given the results obtained with the fluidextract.

TABLE II.—FLUIDEXTRACT OF ACONITE, N. F. (p_H 4.22 AT 25 DEGREES, 10/22/33).

Sample.	Color of Bottle.	Conditions of Storage. Light Conditions.	Closed or Open.	p_H at Storage 10/21/33.	p_H after 13 Mos'. Storage 11/14/34.	Bioassay 1/12/35 M. L. D.
B	Amber	Diffused	Closed	4.22	3.15	0.000035 cc.
A	Amber	Diffused	Opened	4.22	3.12	.....
C	Colorless	Diffused	Closed	4.22	3.12	0.000035
D	Colorless	Diffused	Opened	4.22	2.99	.....
E	Amber	Dark	Closed	4.22	3.15	0.000035
F	Amber	Dark	Opened	4.22	3.07	.....
G	Colorless	Dark	Closed	4.22	3.20	0.0000375
H	Colorless	Dark	Opened	4.22	3.17	.....

The obvious conclusion from the change in p_H value is that there was liberation of an acid or acids. This confirms the conclusions previously advanced that aconitine is hydrolyzed into benzoylaconine and acetic acid and that benzoylaconine is hydrolyzed into aconine and benzoic acid. Since these are official preparations and must therefore have conformed, when the study was begun, to the standards set forth in the U. S. P. and N. F., the minimum lethal dose of the fluidextract must not have been greater than 0.00004 cc. per Gm. body weight of guinea pig and that of the tincture not less than 0.00035 cc. and not more than 0.00045 cc. per Gm. body weight of guinea pig. Reference to the preceding tables will show that in the majority of the samples there has been an increase in activity, *i. e.*, a smaller amount was required to produce death than is required of the official preparations. We have no explanation to advance for this increase in biological activity. It is possible that the inaccuracy of bioassay methods may be the explanation.

The second phase involves stabilization by the addition of acid. For this experiment tincture and fluidextract of Aconite were prepared from Aconite root provided by Eli Lilly and Company. The potency of these preparations was determined biologically. The tincture had a minimum lethal dose of 0.00046 cc. per Gm. body weight of guinea pig and the fluidextract had 0.000039 cc. per Gm. body weight of guinea pig. Samples were brought to definite p_H values by the addition of varying amounts of hydrochloric acid. One-ounce samples of the tincture with p_H values of 1.88, 2.30, 2.50, 2.83, 3.05, 3.20, 3.40, 3.55, 3.83, 3.95, 4.19, 4.40, 4.68 and 5.11, respectively, were stored on December 23, 1933, and a selected few again assayed on April 22, 1935. The results are as follows:

Sample assayed 0.00046 cc./Gm. body weight before storage.
Sample with p_H of 1.88 assayed 0.00045 cc./Gm. body weight after storage.
Sample with p_H of 2.83 assayed 0.00050 cc./Gm. body weight after storage.
Sample with p_H of 3.05 assayed 0.00055 cc./Gm. body weight after storage.
Sample with p_H of 3.95 assayed 0.00065 cc./Gm. body weight after storage.
Sample with p_H of 5.11 assayed 0.00400 cc./Gm. body weight after storage.

One-ounce samples of the fluidextract having p_H values of 1.50, 2.20, 2.65, 2.80, 3.00, 3.26, 3.35, 3.56, 3.80, 4.05, 4.25, 4.40, 4.60 and 4.90, respectively, were stored on December 22, 1933, and a selected few again assayed on April 4, 1935. The results are as follows:

Sample assayed 0.000039 cc./Gm. body weight before storage.
Sample with p_H of 1.50 assayed 0.000035 cc./Gm. body weight after storage.
Sample with p_H of 2.65 assayed 0.000035 cc./Gm. body weight after storage.
Sample with p_H of 3.00 assayed 0.000035 cc./Gm. body weight after storage.
Sample with p_H of 4.05 assayed 0.000040 cc./Gm. body weight after storage.
Sample with p_H of 4.90 assayed 0.000055 cc./Gm. body weight after storage.

Careful inspection of the preceding tabulated data will show that in the case of the tincture decomposition began to take place to a marked degree when the p_H of the sample was 3.95 or above and in the fluidextract when the p_H was greater than 4.05. The increasing minimum lethal doses of the samples are indicative of this conclusion. Swanson (1) has shown that increased acidity tended toward stabilization and later (2) stated that above a p_H of 4.1 the preparations rapidly lost in potency. Wm. I. Baker (3) checked the work of Swanson and agreed with his conclusions. The experiments performed in this laboratory check those of Swanson and Wm. I. Baker and confirm their conclusions that a p_H of 2.5 to 3.0 would be the ideal range for stabilization of the preparations of Aconite.

EXPERIMENTAL—PART II.

Assay.—Before assay procedures could be developed, it was necessary to obtain the alkaloids of Aconite in a chemically pure condition. It was found that only one of the alkaloids, namely aconitine, could be purchased, and this only in an impure form from Merck & Company at Rahway, N. J. It therefore became necessary to purify it, and prepare the two hydrolytic products, benzoylaconine and aconine, from this alkaloid.

Aconitine as purchased from Merck is labeled "Aconitine, Potent, Merck, 10 to 15 times strength of amorphous." No other statement as to its purity is made. The melting point of the product, as received, was 179 degrees which does not check with the accepted value of 195 degrees for aconitine. Titration of accurately weighed samples of the product showed the sample to be only 96% pure. The product was then dissolved in 1% HCl and placed in a vacuum desiccator over phosphorus pentoxide. The crystals of aconitine hydrochloride formed upon concentration were washed with ether and then dried between filter papers. The base was then liberated from the hydrochloride, washed with water, and dried. The melting point was still not sharp at 180° C. The alkaloid was again dissolved in weak HCl acid, crystallized and dried as before and again liberated. This procedure was repeated several times until the hydrochloride melted at 151–153° C. which is well within the range of 149–153° C. given in the literature. The free base melted at 193° C. Titration of accurately weighed samples of the purified base gave values indicative of 99.4% aconitine. Further attempts at purification gave negative results, therefore this alkaloid was accepted for use in the following experiment.

Several methods of preparation of benzoylaconine and aconine were studied and a few tried out. Those giving the best results are given below in detail.

The hydrochloride of aconitine was prepared by dissolving pure aconitine in 1% hydrochloric acid and the solution concentrated in a vacuum desiccator over phosphorus pentoxide and then allowed to crystallize. The crystals were filtered off and dried. Three to four per cent aqueous solutions of the salt were prepared and sealed in thick-walled pyrex test-tubes. These solutions were heated at 120° to 130° C. in an oil bath from three to four hours. The solutions were then filtered and concentrated on a steam-bath. The crystals formed during concentration were filtered off and dissolved in distilled water. This solution was concentrated and the procedure repeated until the crystals of benzoylaconine hydrochloride were of a constant melting point. The melting point of this salt was 212° to 214° C. (uncorr.) which agrees well with that given in the literature.

Liberation of the benzoylaconine from this salt was carried out by carefully adding weak ammonia water and extracting with ether. After evaporating the ether and drying, the base melted at 125° C., which also agrees with other data. This method was employed throughout for the preparation of benzoylaconine and its hydrochloride.

Aconine was prepared by aqueous hydrolysis of aconitine. A mixture of aconitine and water (1 to 2 Gm. in 40 to 50 cc. of water) was sealed in a tube and heated at 120° to 130° C. for several hours. The aqueous solution was then extracted with ether and the ether rejected. After addition of sulphuric acid the solution was again extracted with ether to remove benzoic acid. The aqueous solution was then evaporated to a low volume to drive off the acetic acid. Barium hydroxide was carefully added until precipitation of the sulphate radical was complete. After filtration to remove the barium sulphate the solution was evaporated to dryness. The residue was washed with ether and then dried. The base thus obtained melted at 130–132° C. and its hydrochloride melted at 174–175° C. These values satisfy those given in the literature for aconine and its hydrochloride.

In order to work out an assay for this drug and its preparations, the most feasible method would be one in which the alkaloids could be separated. Attempts were made to do this based upon solubility and precipitants. Since aconine is insoluble in ether in the presence of water this alkaloid is immediately eliminated

by extraction of the other alkaloids with ether. Then the problem becomes one of separating aconitine and benzoylaconine.

Several alkaloidal precipitants were employed in this procedure using the pure alkaloids in the form of their hydrochlorides. In each case a small quantity of each alkaloidal salt was dissolved in a weakly acid aqueous solution and the precipitant added. In every case with the exception of Na_2CO_3 solution and NH_4OH solution saturated or partially saturated with NH_4Cl the two alkaloids, aconitine and benzoylaconine, are precipitated. With the carbonate and hydroxide solution aconitine is precipitated but benzoylaconine is not.

The results show that the two alkaloids cannot be separated by the ordinary alkaloidal precipitants since both are precipitated. There exists in the reactions with ammonium hydroxide and the carbonates some possibility. After repetition of these experiments for confirmatory purposes, a deeper investigation involving these agents was carried out. The results are given later.

Solubility determinations were made on aconitine and benzoylaconine as follows:

The pure alkaloids were first employed by placing a small quantity of each alkaloid on separate watch glasses and adding equal amounts of the solvent to each watch glass. Both alkaloids were found to be soluble in benzene, carbon bisulphide, fairly soluble in *n*-propyl and iso-propyl alcohols, and insoluble, or practically so, in *n*-butyl and amyl alcohols. Both are soluble to about the same extent in di-iso-propyl, dibutyl and di-iso-amyl ethers.

Determinations of the solubility at 25° C. of aconitine hydrochloride and benzoylaconine hydrochloride in water and ethyl alcohol (U. S. P.) were carried out. The procedure followed was to heat a watch glass at 100° C. to constant weight, cool and then place a small quantity of a saturated solution of the salt in question upon it. The two were then quickly weighed and placed in a desiccator over calcium chloride until dry. The glass and solid were then heated at 80° C. for one hour, cooled and weighed. Aconitine hydrochloride was found to be soluble to the extent of 0.1139 Gm. per Gm. of water and 0.7346 Gm. per Gm. of alcohol, while the corresponding values for benzoylaconine were 0.0803 Gm. per Gm. of water and 0.1499 Gm. per Gm. of alcohol. These experiments lead to the conclusion that the alkaloids could not easily be separated on solubility behavior.

The fact that von Planta (4) found aconitine to be partially soluble in sodium carbonate solution and that this aconitine was later found to be of dubious purity, led to the question of whether or not pure aconitine was soluble in sodium carbonate solution. To determine the possibilities appearing in von Planta's work, samples of the pure salts of these alkaloids, aconitine and benzoylaconine, were dissolved in water and treated with bases. The results of these qualitative tests have been mentioned. It will be noted that the surmise of impurity in the aconitine being responsible for the action he observed is somewhat borne out. The results show that the alkalies employed precipitate the aconitine but do not precipitate the benzoylaconine. Advantage was taken of this as a possible means of separation of the two alkaloids. Experiments were carried out in an empirical way on known quantities of the aconitine by dissolving the hydrochloride in a small volume of water and then adding the alkaline solution. Immediate filtration of the precipitate was prevented because the first precipitate of aconitine was very fine and passed through the paper and precipitation was complete only after a lapse of a

few minutes. Immediate filtration was also hindered since, in some cases, a slight precipitate of benzoylaconine was thrown down which returned to solution after a few minutes. The time required for these adjustments could not be cut below thirty minutes. The precipitated aconitine was dissolved in standard acid and titrated with standard base and showed a loss too great to permit this procedure to be of practical value. Apparently the loss was due to hydrolytic decomposition of aconitine because the loss of alkaloid increased as the time of cold digestion of the precipitate increased. The alkaloids could not be separated by ether because the precipitated aconitine was soluble in it and it also extracted the benzoylaconine from the aqueous solution.

The methods described above proved unsatisfactory and the methods tried by other workers also were not of practical use. It therefore seemed to us that the problem should be attacked from a new angle.

It will be recalled that many alkaloids of very similar composition, both empirically and structurally, often vary widely in certain chemical properties. The purine bodies, caffeine, theophylline and theobromine, are a group of such alkaloids. Though these three are quite similar in composition, they do vary widely in some respects. The variation of prime interest at this point is in their dissociation constants. Many other closely related alkaloids show variation in this respect. A similar situation might exist in the case of aconitine and benzoylaconine, and this led us to a study of their dissociation constants. Landolt-Bornstein gives the dissociation constant of aconitine as 3×10^{-8}. The corresponding value of benzoylaconine could not be found. It therefore became necessary to determine this value.

From the relationship existing between the hydrolysis constant of a salt and the hydrogen-ion concentration of the solution, the dissociation constant of the base is readily calculated.

In an aqueous solution of the salt the equilibrium is expressed by the equation:

$$BHCl + H_2O \longleftrightarrow BHOH + HCl$$

which in terms of the ionization theory becomes

$$BH^+ + H_2O \rightarrow BHOH + H^+ \qquad (1)$$

Applying the law of mass action to this equation, we get

$$\frac{(BHOH)\,(H^+)}{(BH^+)} = K_h \qquad (2)$$

where K_h is the hydrolytic constant of benzoylaconine hydrochloride.

If we multiply equation (2) by (OH^-), we obtain

$$\frac{(OH^-)\,(BHOH)\,(H^+)}{(BH^+)\,(OH^-)} = K_h = \frac{K_w}{K_b}, \text{ or,}$$

$$K_b = \frac{K_w}{K_h} \qquad (3)$$

Therefore, we need but to determine K_h in order to find K_b.

Using conductivity water as the solvent, an $N/50$ solution of benzoylaconine hydrochloride was prepared and the p_H of the solution determined using the standard hydrogen electrode. The reading on the potentiometer was 0.649 volts. The p_H may then be calculated from

$$p_H = \frac{E_h - E_o}{(0.0001983)T} = \frac{0.649 - 0.303}{(0.0001983)298} = 5.85$$

In a solution whose p_H is 5.85 the $C_H{}^+$ equals 1.41×10^{-6}
Employing equation (2), we obtain

$$K_h = \frac{(1.41 \times 10^{-6})^2}{0.02} = 10^{-10}$$

Using this value for K_h in (3)

$$K_b = \frac{10^{-14}}{10^{-10}} = 10^{-4}$$

the dissociation constant of benzoylaconine.

A solution whose hydroxyl-ion concentration falls between 3×10^{-8} and 1×10^{-4} should then extract the weaker base, aconitine, and leave the stronger base, benzoylaconine, in solution as the salt. Proceeding on such a basis a solution having a concentration of hydroxyl ion equal to 3×10^{-7} should be approximately correct.

Since, in a $1/100N$ solution of ammonium hydroxide, the ionization constant is approximately 1.8×10^{-5}, an amount of NH_4Cl can be added to depress the hydroxyl ion to the desired concentration. If we assume complete ionization of the NH_4Cl then

$$\frac{1.8 \times 10^{-5}}{3 \times 10^{-7}} \text{ equals } 0.6 \times 10^2 = 60,$$

or the desired solution must be $0.6N$ in NH_4Cl and $0.01N$ in NH_4OH.

Before employing such a solution, it is necessary to determine whether or not aconitine will suffer hydrolysis in it. To determine this, samples of aconitine hydrochloride were dissolved in a small quantity of water and then added to 50 cc. of a solution of $0.01N$ in NH_4OH and $0.3N$ in NH_4Cl. The alkaloid was then extracted with successive small portions of ether, standard acid added in excess, the ether evaporated, and the acid titrated. Results were as follows:

Aconitine Used.	Aconitine Reclaimed.
43.3 mg.	42.8
46.0	45.5
45.2	45.0

This shows that a solution more strongly basic than is required for separation of the alkaloids will not hydrolyze aconitine during the extraction procedure.

The strength of the solution in NH_4OH was varied from $0.01N$ to $0.016N$ and in NH_4Cl from $0.6N$ to $0.85N$ and combinations of these strengths used in attempts to separate the alkaloids. These solutions were employed in extracting the alkaloids separately to determine which solution would set free the smallest quantity of benzoylaconine and still set free all or nearly all the aconitine as it theoretically should. Of the solutions employed, a solution $0.0159N$ in NH_4OH and $0.75N$ in NH_4Cl gave the best results.

The procedure was as follows:

The hydrochloride of the alkaloid was dissolved in 5 cc. of water and this solution added to 50 cc. of the above buffer. The weakly basic aqueous solution was then extracted with ether. Four extractions of 20 cc. each were found to be sufficient to easily remove all the aconitine when each extraction portion was gently shaken for 10 minutes. Ten cc. of standard acid are then added to the combined ether extracts and the ether evaporated. The excess acid is then titrated with standard base. Results are as follows:

Aconitine Used.	Aconitine Reclaimed.	Loss.	Percentage Loss.
41.5 mg.	41.0	0.5	1.2
41.1	40.8	0.3	0.7
41.8	41.5	0.3	0.7
43.2	42.7	0.5	1.1
41.5	41.1	0.4	0.9
40.4	40.0	0.4	1.0
		Average per cent loss	0.93

The following results were obtained for benzoylaconine in the same procedure:

Benzoylaconine Used.	Benzoylaconine Reclaimed.	Per Cent Reclaimed.
44.4 mg.	4.0	9.00
42.4	4.6	10.84
45.2	4.4	9.73
44.5	4.5	10.00
42.6	4.2	9.72
41.3	4.1	9.87
	Average per cent reclaimed	9.86

Then, from such a solution, 99% of the aconitine may be isolated while only 9.86% of the benzoylaconine will be removed. Experiments were then carried out on mixed samples and calculations made in the following manner: From a sample of "x" mg. of aconitine 99% would be removed, or 0.99x mg. Then $\frac{0.99x}{6.45}$ = the cc. of 0.01*N* acid required to neutralize this base. Likewise, from a sample of "y" mg. of benzoylaconine 9.86% would be removed, or 0.0986y mg., and $\frac{0.0986y}{6.03}$ = cc. of 0.01*N* acid required to neutralize this base. The sum of these two quantities of acid should then be the same as the cc. of acid actually required in such a mixed sample. The results below show the comparison of the actual result and the theoretical.

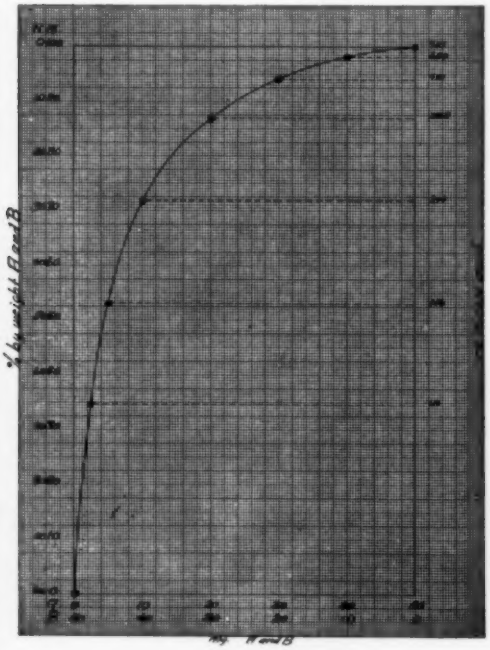
Aconitine used.	$\frac{0.99x}{6.45}$ = Cc.	Benzoylaconine Used.	$\frac{0.0986y}{6.03}$ = Cc.	Total Cc.	Actual Cc.	Difference.
26.6	4.08	18.2	0.26	4.34	3.88	0.46
25.3	3.88	19.1	0.32	4.20	4.26	0.06
26.7	4.09	17.3	0.29	4.38	4.44	0.06
23.8	3.66	16.9	0.29	3.95	4.08	0.07
27.2	4.17	18.8	0 32	4.49	4.44	0.05
25.1	3.85	16.4	0.27	4.12	4.23	0.11

Comparison of the theoretical number of cc. of acid with the actual number of cc. required as given in the above data shows close agreement with exception of the first sample. Some error, probably a burette reading, has apparently crept in since the other 5 samples are in good harmony. It does not appear amiss to assume from this data that the procedure holds on the mixed alkaloids.

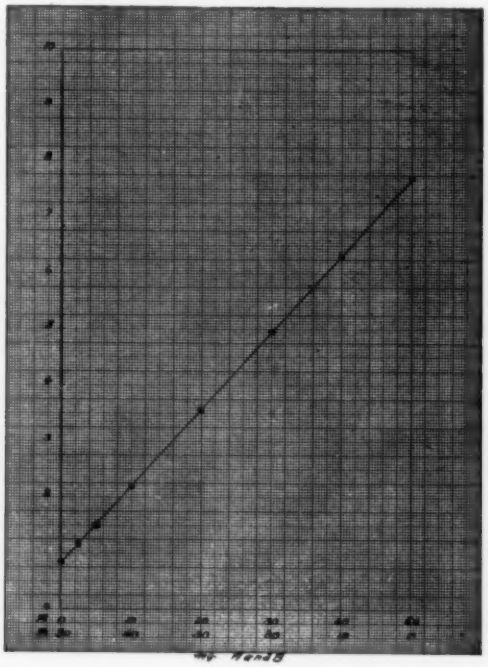
In any mixed sample of the two alkaloids treated in the preceding manner the extracted mixture of alkaloids will be composed of a certain amount of aconitine and the remainder will be benzoylaconine. If a graphical relationship is set up for these facts as explained below, certain other useful data may be derived. If we base the comparison on a mixture of the alkaloids weighing 50 mg. and then select various combinations which equal 50, it is found that the per cent of one

alkaloid in the extracted mixture, following the previous procedure, varies with the composition of the original mixture. These per cent values plotted against total weight give rise to the following curve. The points may be located as follows: In a mixture in which 40 mg. of aconitine and 10 mg. of benzoylaconine are present originally, 39.6 mg. of aconitine and 0.986 or 1 mg. of benzoylaconine will be extracted making a total of 40.6 mg. of extracted alkaloids. Then the amount of aconitine present in 40.6 mg. of total alkaloids is 97.54% and likewise there is present 2.46% benzoylaconine. This point then is plotted as indicated. Others are found in the same manner.

Using other total quantities of alkaloids in the original mixture, calculating and plotting as before gives rise to the same type of curve. If, at these loci, as in the preceding graph, the amount of acid required to neutralize such a mixture is calculated on the basis of aconitine, it is found that these points on the ordinate are



Graph 1.



Graph 2.

a logarithmic function. If now the acid ordinate is plotted in units the following graph is obtained and likewise with a total of 100 mg. a straight line is obtained which possesses the same slope but a different intercept.

With the proper constants introduced to control the intercept and slope, it should be possible to calculate the amount of aconitine present in a sample from the equation of this line.

In this graph, if h equals the total alkaloids calculated as aconitine and A equals the mg. of aconitine, then (h − A) equals the mg. of benzoylaconine.

Therefore, $\frac{0.99A + (0.0986)\,(h - A)}{6.45}$ equals the cc. of $0.01N$ acid required to titrate the combined alkaloids, and this is expressed on the y axis of the graph.

Then $y = 0.1382A + 0.01592h$ (4)

As a check on this equation, let A = 100;

$$\text{Then } y = 13.8 + 1.5 = 15.3$$

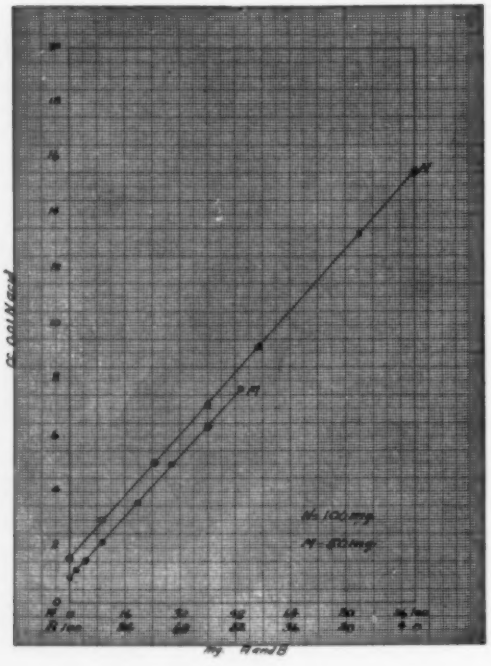
Reference to the immediately preceding graph shows this value to check. Proceeding with equation (4) and solving for A,

$$A = 7.236y - 0.1106h$$

This is the equation from which aconitine may be calculated in mg. where "y" is the cc. of 0.01 acid required to combine with the extracted alkaloids and "h" is the total mg. of alkaloids in the sample. To check this we need but refer to the preceding table of mixed samples. Selecting Sample 2 as an example and proceeding by equation

$$A = (7.236)\ (4.26) - (0.1106)\ (44.4)$$
$$A = 25.9$$

This is in good agreement with the original quantity of aconitine, 25.3 mg., used.



Graph 3.

To apply such procedure to the preparations of Aconite, the fluidextract prepared earlier in this work and used for determining the change in p_H on storage was selected as the test preparation. To 10 cc. of the fluidextract, 1 cc. of 10% sulphuric acid was added and the alcohol evaporated on a steam-bath. Twenty cubic centimeters of water were then added and the whole filtered and the filter paper and slight residue washed well with water. The filtrate was then shaken out with 20 cc. of ether to remove coloring matter. The aqueous portion was then carefully made alkaline with 10% ammonium hydroxide and shaken out with three 20-cc. portions of ether, shaking each portion 5 minutes. This was found to remove all the alkaloids. From 4 samples the following results were obtained:

Sample.	Mg. of Alkaloids.
1	41.3
2	42.1
3	41.1
4	42.1
Average	41.7

In order to separate the aconitine from the benzoylaconine, the neutralized solutions of alkaloids from above were each added to 50 cc. of the buffer, 0.0159*N* NH_4OH–0.75*N* NH_4Cl, and the solution extracted with four portions of ether of 20 cc. each. Standard acid was added to the ether extracts, the ether evaporated, and the excess acid titrated with standard alkali. Results were as follows:

Sample	Mg. Aconitine *
1	25.3
2	25.1
3	25.3
4	24.9
Average	25.2

* By equation.

The fact that Na_2SO_4 had been added to the buffer solution when the neutralized solution of alkaloids was added was checked both theoretically and practically at this point. Theoretically a mixture of 10 cc. of 0.01*N* H_2SO_4 and 10 cc. of 0.01*N* NaOH would not produce sufficient Na_2SO_4 to destroy the buffer. Practically, the result was tested by determining the p_H of the buffer and then determining the p_H of 50 cc. of the buffer plus 20 cc. of the Na_2SO_4 solution. The change in p_H was not noticeable by the potentiometric method.

To test this method of assay samples of the same fluidextract were used with the addition of known quantities of aconitine. After addition of the alkaloid the same procedure of separation was followed. Results are as follows:

Sample.	Cc. F. E.	Added Aconitine.	Total Alkaloids (h).	Cc. 0.01*N* Acid (y).	Total Aconitine.	Difference (See Below).
1	10	23.9	54.5	6.60	42.6	17.9
2	10	25.9	63.2	8.16	52.0	26.8
3	10	22.9	60.9	7.46	47.3	22.1
4	10	20.9	62.3	7.31	46.0	20.8
5	10	21.2	61.1	7.35	46.4	21.2
6	10	22.3	61.2	7.64	48.5	23.3

(According to previous assay each 10 cc. of fluidextract had 25.2 mg. aconitine. Therefore, the difference equals the total aconitine minus 25.2 and this should be compared with the added aconitine.)

This test, as applied, shows that the procedure of assay employed determines the amount of aconitine present within reasonable expectancy. With the exception of Sample 1 the difference between the total aconitine removed and the aconitine presumably present in the fluidextract as shown previously checks the known added amount of pure alkaloid within reasonable error. This method, then, may be employed to determine the amount of aconitine present.

Aconitine of the U. S. P., when administered subcutaneously, has a minimum lethal dose of not less than 0.00,000,005,5 Gm. and not more than 0.00,000,006,5 Gm. for each Gm. of body weight of guinea pig. The standard for the U. S. P. tincture, when administered subcutaneously, is a minimum lethal dose of not less than 0.00,035 cc. and not more than 0.00,045 cc. for each Gm. of body weight of guinea pig. The standard in the N. F. for the fluidextract, when administered subcutaneously, is a minimum lethal dose not greater than 0.00,004 cc. for each Gm. of body weight of guinea pig.

Assuming that aconitine is the only toxic agent, then by mathematical calculation, each 100 cc. of U. S. P. tincture should contain not less than 14.4 mg. and not more than 15.7 mg. of aconitine and each 10-cc. portion of fluidextract should contain not less than 14 mg. of aconitine. This, then, should give something of a check between the bioassay and chemical assay methods of Aconite preparations. However, we must not lose sight of the fact that in the bioassay the hydrolytic products of aconitine and other extractive from the drug may have a considerable effect on the toxic action of aconitine.

Four samples of preparations of Aconite made by reputable manufacturers were obtained for investigation. Two of these samples were tinctures and two were fluidextracts. These were subjected to the chemical assay process developed in this study. The results of the assay along with pertinent remarks on the label of

the preparation are tabulated below. Key letters are employed in order that reference to research data may be easily made if desired.

Sample A: Labeled—

"Tincture of Aconite. Physiologically standardized. This product differs from U. S. P. tincture in being slightly acidified to retard deterioration."

Chemical assay yields 18 mg. aconitine per 100 cc.

Sample B: Labeled—

"Tincture of Aconite, U. S. P. X. Physiologically standardized."

Chemical assay yields 12.9 mg. aconitine per 100 cc.

Sample C: Labeled—

"Fluidextract of Aconite. Physiologically standardized. This product differs from the N. F. fluidextract in being slightly acidified to retard deterioration."

Chemical assay yields 14.2 mg. aconitine per 10 cc.

Sample D: Labeled—

"Fluidextract of Aconite, N. F. Standard—Minimum lethal dose 0.00005 cc. per Gm. body weight."

Chemical assay yields 17.5 mg. aconitine per 10 cc.

From these results definite conclusions cannot be drawn. However, certain indications may be noted. In the case of the samples of Tincture of Aconite: Sample A was stabilized by addition of acid and, for this reason, cannot be labeled U. S. P., but it was physiologically standardized and, no doubt, to meet the U. S. P. requirements. This sample was high in aconitine according to chemical assay. Sample B, according to the label, is U. S. P. and cannot have had acid added for stabilization purposes. This sample yields but 12.9 mg. of aconitine when assayed chemically which is low. This would be expected due to deterioration.

It is more difficult to draw conclusions from the data on fluidextracts because no definite standard, or rather limit of standard is required by the N. F. However, to meet the requirements of the N. F. they must assay not less than 14 mg. of aconitine per 10 cc. as previously shown. Both of these samples come up to standard but there are indications that the producer of Sample D may have put out a product of excessive potency, with the idea that the ultimate consumer would have at his disposal a product which would meet the requirements of the standard. Sample C, being stabilized, needs no such protection and assays very nearly the standard amount of aconitine.

From these results it appears reasonable to suggest the following assay for Aconite preparations:

To 10 cc. of the fluidextract, or 100 cc. of the tincture, add 1 cc. of 10% H_2SO_4 and evaporate the alcohol on a steam-bath. Add about 20 cc. of water and filter off the insoluble residue, washing the paper and its contents several times with small portions of water and finally with one or two small portions of acidulated water, collecting the filtrate and washings in a separatory funnel. Shake out with 20 cc. of ether to remove coloring matter and discard ether. Carefully add 10% NH_4OH until the solution is faintly basic to litmus and then completely extract the alkaloids with successive portions of ether. Add 10 cc. of 0.01*N* acid to the combined ether extracts, evaporate the ether on a steam-bath, cool, add 3–4 drops of methyl red and titrate with 0.01*N* base. The number of cc. of 0.01*N* acid consumed multiplied by 6.45 gives the mg. of total alkaloids calculated as aconitine. Transfer the neutralized solution of total alkaloids to a separatory funnel containing 50 cc. of the buffer solution (0.0159*N* NH_4OH–0.75*N* NH_4Cl) and extract with four portions of ether, of 25 cc. each, shaking each extraction about 10 minutes. Again add 10 cc. of standard acid to the combined ether extracts and evaporate the ether on a steam-bath, cool, add

one drop of methyl red and titrate the excess acid with 0.01*N* base. The number of cc. of 0.01 acid consumed is the value substituted for "y" in the equation

$$A = 7.236y - 0.1106h$$

in which h = total alkaloids. A = the number of mg. of aconitine present in the sample.

SUMMARY.

Aconitine, considered to be the active toxic principle of Aconite and its preparations, is easily hydrolyzed and some of its hydrolytic products cannot be readily separated from it by the usual chemical methods such as precipitation, extraction, etc. It therefore becomes necessary to determine the aconitine in the presence of at least one of its hydrolytic products, benzoylaconine, which can be done by a method which is based on a study of the dissociation constants of the two alkaloids. By extracting the alkaloids with ether from their solution in which the hydrogen-ion concentration is controlled by a buffer solution a definite percentage of the total amount of each alkaloid present is removed, and a curve indicating this relationship can be constructed. An equation may be derived from this curve by means of which the amount of aconitine can be determined. On the basis of this relationship a satisfactory assay process has been developed.

CONCLUSIONS.

1. Preparations of Aconite change in p_H value on storage, becoming more acidic thus bearing out the supposition that an acid is liberated by the decomposition of aconitine.

2. Addition of an acid (preferably HCl) to produce a p_H of 2.5 to 3.0 stabilizes the preparations of Aconite. This agrees with the results of other investigations.

3. Aconitine and benzoylaconine possess dissociation constants of 3×10^{-8} and 1×10^{-4}, respectively.

4. On this basis the two alkaloids may be extracted with ether from a buffered solution in a ratio such that the equation,

$$A = 7.236y - 0.1106\,h,$$

in which A = mg. aconitine, y = cc. of 0.01*N* acid required in the final titration, and h = the total alkaloids present in the sample, yields the amount of aconitine.

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Since the completion of the thesis, seven more preparations of Aconite have been assayed by this method with the following results:

1. "Fluidextract Aconite No. 3, 3,056,164. Standard-M. L. D. 0.00004 cc. per Gm. body weight." Assayed chemically—16.0 mg. per 10 cc.

2. "Fluidextract Aconite No. 3, 3,066,570. Standard-M. L. D. 0.00004 cc. per Gm. body weight." Assayed chemically—15.3 mg. per 10 cc.

3. "Fluidextract Aconite No. 2, 910,036A. Biologically standardized." Assayed chemically—14.3 mg. per 10 cc.

4. "Tincture Aconite No. 1, 3,071,282. Standard-M. L. D. 0.0004 cc. per Gm. body weight." Assayed chemically—13.6 mg. per 100 cc.

5. "Tincture Aconite No. 1, 909,454A. Biologically standardized." Assayed chemically —14.0 mg. per 100 cc.

6. "Tincture Aconite 'E.'" Assayed chemically—11.0 mg. per 100 cc.

7. "Tincture Aconite for Experimental Purposes." Assayed chemically—14.1 mg. per 100 cc.

Of the three samples of Fluidextract of Aconite, all of them met the requirements which we calculated to be equivalent to the N. F. requirements, that is, they contained at least 14 mg. of aconitine per 10 cc.

Of the four samples of Tincture of Aconite, one (Sample No. 6) should be eliminated because it was not indicated to be of U. S. P. strength, and one (Sample No. 4) fell below the strength we calculated to be equivalent to that of the U. S. P., that is, 14.4 to 15.7 mg. per 100 cc.

The other two tinctures met the requirement calculated to be equivalent to the U. S. P. requirement.

This is further evidence that the chemical assay process for Aconite and its preparations as recommended by us should be substituted for the present U. S. P. process.

VOLATILE OIL FROM WESTERN YARROW.*

BY R. L. MCMURRAY.[1]

Considerable discussion has occurred as to whether the yarrow of the western states is the same species as that which grows in the eastern states. In 1834 Thomas Nuttall (1) classified the western yarrow as *Achillea lanulosa* Nuttall. This work was made on material collected while with the N. B. Wyeth expedition in the region of the falls of the Columbia River east to the first navigable waters of the Missouri River. The Index Kewensis (2) lists this not as a new species, as did Nuttall, but the same plant as *Achillea Millefolium* Linné. C. V. Piper (3) made a third classification by combining the preceding and giving it the name *Achillea Millefolium lanulosa* (Nutt.) Piper. Since taxonomists disagree on this plant, or plants, it was considered of possible interest to determine the constants of the volatile oil and compare them with those reported for other volatile oils of *Achillea Millefolium* Linné.

The material was gathered from various local habitats in Whitman County, Washington, during the second week of July, 1935. The flower-heads were clipped off and collected into bags. The stems and leaves were rejected. All foreign materials were carefully excluded. Collecting was done during the entire day. The flower-heads amounted to about 76 pounds in the fresh condition. They were packed the same day into a small steam distillation apparatus (capacity about 20 pounds of material) and distilled with "high pressure" steam.

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* Scientific Section, A. PH. A., Portland meeting, 1935.

[1] Ohio State University, College of Pharmacy; operations performed at Washington State College, School of Pharmacy.

Careful note was taken during the entire process of distillation to observe when the azulene might come over; the question arose some time ago as to whether this constituent distilled over at the beginning or toward the end of the distillation. No blue color was observed to come over at any time, even though the distillation was continued 3 hours after the oil was considered to be entirely dispelled from the plant. On the other hand, the eastern yarrow yields this blue color (due to azulene, a hydrocarbon) by distilling both the fresh and dried plants and from the petroleum ether extract (4) of the dried plant. Thus azulene is apparently absent from the western yarrow.

The 76 pounds of clipped fresh flower-heads yielded 108.3 cc. of colorless volatile oil. In addition the aqueous distillate produced 8.4 cc. of colorless volatile oil by cohobation. A total of 116.7 cc. of volatile oil was obtained, equivalent to 0.305 per cent of the clipped fresh flower-heads.

The following constants were obtained for this volatile oil (oil recovered by cohobation was excluded) of *Achillea Millefolium lanulosa* (Nutt.) Piper:

Specific gravity at 25° C.	0.8995
Specific rotation at 25° C.	−8.98
Refractive index at 25° C.	1.4657
Acid number	1.82
Saponification number	26.75
Ester number	24.93

The following constants were determined in 1931 by the author for Wisconsin volatile oil of *Achillea Millefolium* Linné:

Specific gravity at 25° C.	0.9066
Specific rotation at 25° C.	−14.11
Refractive index at 25° C.	1.4703

Roland Kremers (5) reported the following constants for a volatile oil from a Wisconsin crop of *Achillea Millefolium* Linné grown in 1919:

Specific gravity at 17° C.	0.913
Acid number	4.27
Saponification number	10.92
Ester number	5.65

Thus the volatile oil from the western yarrow differs from that of the eastern yarrow in color and in the chemical and physical constants. This difference may be due to soil, climate or to being a different species of *Achillea*. If soil or climate are the direct factors, growing the western yarrow in an eastern habitat for several generations should produce a blue oil but, on the other hand, if the western yarrow is truly a different species it is doubtful if change of climate or soil would have so much an effect on the volatile oil.

This work has indicated that laboratory control would be necessary for acceptance of products from a new geographical source, even though taxonomists may insist that the plant concerned is identical with that from other habitats

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THE DETERMINATION OF SMALL QUANTITIES OF FLUORINE IN DICALCIUM PHOSPHATE.*

BY S. E. HARRIS AND W. G. CHRISTIANSEN.[1]

INTRODUCTION.

The physiological effect of fluorine has been the subject of numerous studies in recent years. It has been shown by experiments upon animals that fairly large doses have a definite retarding influence upon growth. This was established by the use of rock-phosphate, containing 3–4% fluorine, to supply a mineral supplement in the diet of farm animals. The animals receiving this supplement did not flourish as did animals receiving calcium-phosphorus supplements in other forms, and the undesirable effects were traced to the presence of fluorine.

In smaller quantities, fluorine is found to affect the teeth. McClure and Mitchell (1), in studies made upon rats, found that in spite of earlier evidence to the contrary (2) there was no difference between soluble and insoluble fluorides in this respect. DeEds and Thomas (3) in a study of the effect of various fluorides and fluosilicates upon the teeth of male white rats, reported that the solubility of the fluorine compound was not a factor in its toxic effect, and that amounts of 0.5–1.0 mg. of fluorine per day per Kg. body weight can produce definite signs of toxicity. Smith and Leverton (4) also concluded, from experiments upon rats, that the solubility of the fluoride bears no relation to the amount which will cause initial tooth damage. Smith (5, 6, 7) in a study of the effect of drinking water upon children during the formation of the permanent teeth found that mottled teeth were always associated with the use of water containing more than 0.9 parts per million of fluorine.

Dicalcium phosphate has been found to be a valuable dietary supplement in doses of 3–5 Gm. daily. The phosphoric acid from which it is manufactured is derived from fluorine-bearing phosphatic rock, and a method for the determination of fluorine in the dicalcium phosphate is necessary, since traces of fluorine may persist through the manufacturing operations, and remain as calcium fluoride.

Various methods of determining fluorine in relation to phosphatic materials have been studied by Reynolds (8) who recommends the procedure of Willard and Winter (9, 10). This is based upon the distillation of the sample with 60% perchloric acid, the fluorine being volatilized in the form of hydrofluosilicic acid. It is determined in the distillate by titration with thorium nitrate solution, using a sodium alizarin sulphonate–zirconium nitrate lake as indicator. The method is rapid and accurate and can be used without recourse to special apparatus. In a

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* Scientific Section, A. PH. A., Portland meeting, 1936.

[1] Research Department of the Chemical and Pharmaceutical Laboratories, E. R. Squibb and Sons, Brooklyn, New York.

later paper (11) Reynolds showed that phosphoric acid could not be used in place of perchloric acid for the isolation of the fluorine, for the presence of phosphoric acid in the distillate introduced serious errors into the results. He further showed that in the distillation of large samples of insoluble phosphates enough phosphoric acid appeared in the distillate to affect the results. He recommended applying a correction for this phosphate or eliminating it by neutralizing the distillate, evaporating it to small bulk and repeating the distillation with perchloric acid.

EXPERIMENTAL.

Our early studies were directed to the application of Reynolds' modification of the Willard and Winter method. The amounts of fluorine present in good quality in dicalcium phosphate are of the order of 0.005% (50 parts per million) or less. The distillation of a 10-Gm. sample of such material gave a final solution to be titrated which was equivalent to less than 1.0 cc. of the thorium nitrate solution. The use of more dilute thorium nitrate solution did not lead to greater accuracy owing to the indefinite end-point produced. In addition, the method required two distillations, two evaporations from 150 cc. to 5 cc. and various transfers from one vessel to another. Not only was there the possibility of loss of fluorine, but considerable time was required. A better method of determining the fluorine in the distillate was therefore sought.

Colorimetric methods for the determination of fluorine have recently been described by Sanchis (12) and by Wichman and Dahle (13). Of these two, that of Sanchis offered the most promise as it is stated by the author to be unaffected by traces of phosphate (up to 5 parts per million). The method, which was originally designed for the determination of fluorine in drinking water, was successfully applied to the distillates obtained by the Willard and Winter method. It consists of measuring the fading of a zirconium alizarin lake produced by the unknown fluorine distillate by comparison with the fading produced by known amounts of fluorine. Our procedure follows:

I. ISOLATION OF THE FLUORINE.

Ten grams of the sample are placed in the distillation flask (to be described below) together with 15–20 glass beads and 20 cc. of distilled water. Forty cc. of 60% perchloric acid are then added through the dropping funnel and the contents of the flask distilled. The temperature rises from 110° C. to 135° C. and is then maintained between 135° and 150° by addition of water through the dropping funnel. Two hundred cc. of distillate are collected and the volume of the distillate made up to exactly 250 cc. with distilled water. It is advisable to remove the beads after three or four distillations. Their surfaces may be revived by boiling for a short time with hydrochloric acid.

II. DETERMINATION OF FLUORINE IN THE DISTILLATE.

Since the Sanchis method is only accurate for quantities of less than 0.3 mg. fluorine the procedure is modified according to the fluorine content of the original sample.

The reagents required are:

(*a*) Standard sodium fluoride, 1 cc. = 0.01 mg. fluorine.
(*b*) Three-normal hydrochloric acid.
(*c*) Three-normal sulphuric acid.
(*d*) Indicator solution, prepared as follows:

1. 0.17 Gm. sodium alizarin sulphonate is dissolved in 100 cc. distilled water.
2. 0.87 Gm. crystalline zirconium nitrate is dissolved in 100 cc. distilled water.

Equal volumes of 1 and 2 are mixed and allowed to stand over night, and the resulting solution diluted with four volumes of distilled water.

(*a*) *Fluorine Content above 0.003% (30 Parts per Million) or Entirely Unknown.*—A small aliquot of the distillate, say 10 cc., is withdrawn and the amount of 0.1 normal sodium hydroxide required for exact neutralization determined by titration using phenol phthalein as indicator. Three aliquots, 10, 25 and 50 cc., are then placed in 250-cc. flasks and the amounts of 0.1 normal sodium hydroxide required to neutralize them added. The volumes are then made up to 95 cc. and 2-cc. portions, accurately measured, of three-normal hydrochloric acid, three-normal sulphuric acid and indicator solution, are added. The flasks are heated rapidly to the boiling point and then cooled in a dark cupboard over night. At the same time and with the same three-normal hydrochloric acid, three-normal sulphuric acid and indicator solution a number of standards are made up from the sodium fluoride solution covering the range 0 to 0.3 mg. fluorine (0 to 30 cc. of the solution). Two-cc. intervals are usually sufficient, but for great accuracy 1-cc. intervals may be used. The volumes are made up to 95 cc., the reagents added and the boiling carried out exactly as for the unknown aliquots.

After standing over night the colors of the unknowns are matched with the standards and the fluorine content of the sample calculated. The use of three aliquots for an unknown is usually sufficient to give at least one of them within the range 0–0.3 mg. fluorine. If, however, the fluorine content is known to be within certain limits, say 0.005–0.008%, obviously only one aliquot need be taken and a smaller number of standard samples used.

(*b*) *Fluorine Content below 0.003% (30 Parts per Million).*—The distillate is collected and made up to 250 cc. as before and the small aliquot titrated with 0.1 normal sodium hydroxide. The whole remaining distillate is then neutralized and evaporated to 90 cc. This is then treated with three-normal hydrochloric acid, three-normal sulphuric acid and indicator solution as before and compared with a set of standard solutions. This procedure permits the color comparison to be made at a higher point in the scale 0–0.3 mg. fluorine, where the matching is easier, the red colors at the lower end being less easy to distinguish. In calculating the fluorine content of the sample allowance must be made here for the small aliquot titrated with 0.1 normal sodium hydroxide.

The above procedure was applied to a number of mixtures of a pure dicalcium phosphate with known amounts of fluorine, and found to give satisfactory results. The pure dicalcium phosphate was prepared from recrystallized specimens of sodium phosphate and calcium bromide.

TABLE I.—RESULTS OF ASSAYS ON 10-GM. SAMPLES OF DICALCIUM PHOSPHATE.

	Mg. Fluorine Added.	Total Fluorine Found—Mg.	Added Fluorine Found.
Dicalcium phosphate	..	0.06	..
Dicalcium phosphate + sodium fluoride	0.10	0.15	0.09
Dicalcium phosphate + sodium fluoride	0.20	0.25	0.19
Dicalcium phosphate + calcium fluoride*	0.25	0.31	0.25

* The addition of the calcium fluoride was accomplished by placing 0.5 Gm. pure lime in the distilling flask and adding a solution of sodium fluoride containing the desired quantity of fluorine. The mixture was boiled to insure complete reaction and the 10 Gm. of pure dicalcium phosphate added. The distillation and determination were then carried out as described above.

DISCUSSION OF RESULTS.

Although the Willard and Winter distillation may be carried out without special apparatus, there is danger that excessive amounts of phosphoric acid may be carried over into the distillate by entrainment. This is especially the case with the large samples used here, and would either lead to serious errors, or necessitate a second distillation, as recommended by Reynolds (11). It was found in practice that the

special distillation flask shown in the sketch minimized phosphoric acid entrainment and had other advantages.

The large ground joint (size 15 or 20) by which the dropping funnel is attached serves as a convenient means of introducing the sample and beads and is easily washed clean by the 20 cc. of water next added. The short Vigreux column (6 inches long) and sleeve method of attaching the thermometer prevents contact between rubber and hot perchloric acid as well as entrainment. The ground joint connecting the condenser to the distillation flask may be dispensed with but it is preferable to the frequent replacement of softened rubber stoppers.

The phosphate content of a number of distillates was determined by applying the method for phosphate under ammonium nitrate in the American Chemical Society Recommended Specifications for Analytical Reagent Chemicals (14) to 50-cc. aliquots of the distillate. Only traces were found, the largest quantity measured was 0.05 mg. phosphoric acid. This quantity would be present if the 50-cc. aliquot were used, and upon dilution to 95 cc. and addition of reagents (total volume *ca.* 100 cc.) would correspond to a phosphate content of 0.5 part per million under Sanchis' conditions. In cases where the entire distillate must be used after evaporation this would

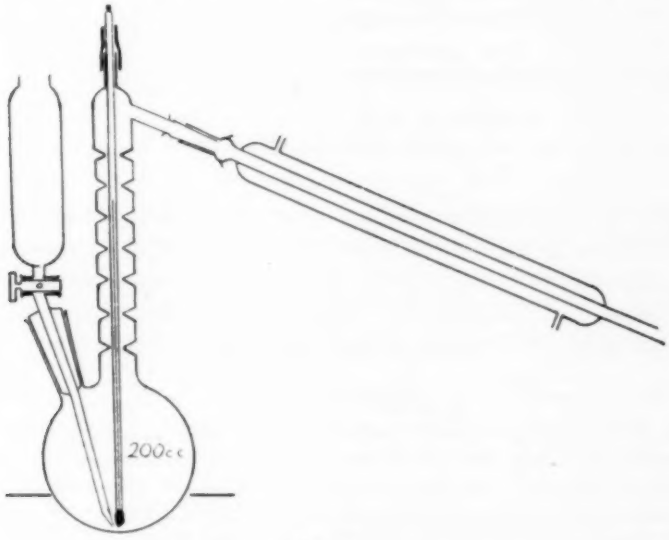

Fig. 1.

amount to the limiting value of 5 parts per million. In only one case, however, was the phosphate measurable and by not forcing the distillation too rapidly there is little likelihood of error from this source.

SUMMARY.

A method for the determination of small quantities of fluorine in dicalcium phosphate has been described. The procedure involves the isolation of the fluorine as hydrofluosilicic acid by distillation with perchloric acid and the colorimetric determination of the fluorine in the distillate by means of zirconium nitrate–sodium alizarin sulphonate. A convenient apparatus for the distillation of the large samples necessary has also been described.

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A NEW TYPE OF HYPNOTIC AMIDE. *N*-(β-KETO PROPYL) DIETHYL ACETAMIDE.*,[1]

BY W. A. LOTT AND W. G. CHRISTIANSEN.

N-(β-keto propyl) diethyl acetamide

was prepared as an example of a new type of hypnotic amide, in which it was hoped that the acetonyl residue might contribute the hypnotic activity residing in acetone itself, so that the activity residing in the diethylacetyl residue would be reinforced. Actually we found that although the compound did display hypnotic action, it was of a very low potency as compared with hypnotics currently in use.

EXPERIMENTAL.

10.1 Gm. of diethylacetyl chloride, boiling point 130–140° C., were added to a solution of 12 Gm. of anhydrous pyridine in 50 cc. of anhydrous benzene. Immediately, the white crystalline molecular compound separated. To this was now added 10 Gm. of amino acetone hydrochloride prepared from chloracetone by the well-known Gabriel synthesis.[2] The reaction mixture was now agitated without heating, whereupon the molecular compound of pyridine and the acid chloride soon disappeared and a yellow crystalline material separated out in its place. After three hours this appeared to be complete, but the reaction mixture was allowed to stand over night.

On the next day, the reaction mixture was diluted with ether and extracted with dilute sulphuric acid solution in order to remove the pyridine; the benzene-ether solution was dried with sodium sulphate and concentrated. Only about 1.25 Gm. of product were obtained in crystalline condition. After recrystallization from benzene the product was pure white and crystalline, melting at 96–97° C.

Nitrogen: Found, 7.91%; calculated for $C_9H_{17}O_2N$, 8.18%.

The minimum effective hypnotic dose for rats is slightly less than 1600 mg. per kilo, as determined in our Biological Research Laboratories. We gratefully acknowledge this assistance.

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* Scientific Section, A. PH. A., Portland meeting, 1935.

[1] Research Department of the Chemical and Pharmaceutical Laboratories, E. R. Squibb and Sons, Brooklyn, N. Y.

[2] Houben and Weyl "Arbeitsmethode der organische chemie," 2nd Edition, volume 4, page 258.

DRUG EXTRACTION. VIII. THE EFFECT OF MACERATION AND RATE OF FLOW ON THE EFFICIENCY OF PERCOLATION.*,[1]

BY WILLIAM J. HUSA[2] AND C. L. HUYCK.

Percolation experiments using 100-Gm. portions of belladonna root have indicated (1) that maceration causes a slight increase in efficiency of extraction of alkaloids and a definite increase in the proportion of total extractive in the reserve portion. Further experiments have been carried out on belladonna root, cinchona and nux vomica, using quantities of drug more comparable to the 1000 Gm. called for in official formulas.

EXPERIMENTAL PART.

Experiment I.—An experiment was carried out to determine whether or not 48 hours' maceration after packing had any influence on the efficiency of percolation either in slow percolation or fast percolation. Four portions of 800 Gm. each of belladonna root in No. 40 powder were percolated with a menstruum of alcohol 5 volumes—water 1 volume, each portion of drug being moistened with 480 cc. of menstruum. In the present experiment "slow percolation" is at a rate of 10 drops per minute for the reserve and 20 drops per minute for the weak percolate, while "fast percolation" is at twice this rate.

The effect of time of maceration and rate of percolation on the quantity of alkaloid and total extractive in the reserve portion of 640 cc. is shown in Table I.

TABLE I.

	Gm. Total Alkaloids in Reserve Portion.		Gm. Total Extractive in Reserve Portion.	
	No Maceration.	48 Hours' Maceration after Packing.	No Maceration.	48 Hours' Maceration after Packing.
Slow percolation	3.18	3.17	46.5	48.3
Fast percolation	2.96	2.99	47.7	43.6

In this experiment, maceration for 48 hours after packing does not show any advantage in extraction of alkaloids either in slow or fast percolation. In fast percolation the rate of extraction of alkaloids is somewhat lower than in slow percolation.

Experiment II.—An experiment was carried out to determine the efficiency of extraction at different rates of flow. Three portions of 800 Gm. each of belladonna root in No. 40 powder were percolated with a menstruum of alcohol 5 volumes—water 1 volume, each portion of drug being moistened with 480 cc. of menstruum and macerated for 15 minutes before packing and 48 hours after packing. The following rates of flow were used; very slow (0.5 cc. per minute); slow (1 cc. per minute); moderate (2 to 3 cc. per minute). The effect of rate of flow on the quantity of alkaloid and total extractive in the reserve portion of 640 cc. is shown in Table II.

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TABLE II.

	Rate of Percolation.		
	Very Slow.	Slow.	Moderate.
Gm. total alkaloids in reserve portion	3.13	3.13	3.12
Gm. total extractive in reserve portion	43.5	49.8	49.1

From this experiment it appears that percolation at the moderate rate of flow gives just as efficient extraction as the slower rates of percolation which were tested.

Experiment III.—In order to secure results showing different combinations of the various factors an experiment was carried out in which the rate of flow was kept constant at 2 to 3 cc. per minute in all the percolators and the other factors varied. Four portions of 800 Gm. each of belladonna root in No. 40 powder were percolated with a menstruum of alcohol 5 volumes—water 1 volume, each portion being moistened with 480 cc. of menstruum.

TABLE III.—EFFECT OF VARIATIONS IN MACERATION.

Hours of Maceration.		Gm. Total Alkaloids in Reserve Portion.	Gm. Total Extractive in Reserve Portion.
Before Packing.	After Packing.		
0	0	3.3	77.1
6	0	3.3	77.2
0	48	3.4	79.6
6	48	3.4	80.7

The above results indicate that maceration after packing causes a slight increase in efficiency of extraction of alkaloids and total extractive. Maceration before packing seems to be of no importance.

Experiment IV.—An experiment was carried out to determine whether or not maceration for 48 hours after packing had any influence on the efficiency of percolation of yellow cinchona, either in slow or fast percolation.

Four portions of 500 Gm. each of yellow cinchona in No. 40 powder (assaying 10.0% alkaloids) were percolated, using the U. S. P. X Type Process B except for variations in maceration and rate of flow. Each portion of drug was moistened with 300 cc. of Menstruum I (glycerin 1 vol.—hydrochloric acid 1 vol.—alcohol 8 vols.) and macerated for 15 minutes before packing.

TABLE IV.—ASSAY RESULTS ON RESERVE PORTION.

Rate of Flow in Cc. per Minute.	Gm. Totol Alkaloids in Reserve Portion.		Gm. Total Extractive in Reserve Portion.	
	No Maceration.	48 Hours' Maceration after Packing.	No Maceration.	48 Hours' Maceration after Packing.
1	24.4	26.2	164.9	175.8
3 to 5	22.6	25.7	147.7	170.8

This experiment shows a slight advantage for the 48-hour maceration period after packing; slow percolation gave slightly better results than fast percolation.

Experiment V.—An experiment was carried out to determine whether or not maceration for 48 hours after packing had any influence on the efficiency of percolation of nux vomica in either slow or fast percolation.

Four portions of 500 Gm. each of nux vomica in No. 40 powder (assaying 2.35% alkaloids) were percolated using Type Process B except for variations in maceration and rate of flow. The following menstrua were employed: Menstruum I: acetic acid 100 cc., water 150 cc., alcohol 750 cc.; Menstruum II: alcohol 3 volumes—water 1 volume. Each portion of drug was moistened with 300 cc. of Menstruum I and macerated for 15 minutes before packing.

TABLE V.—ASSAY RESULTS ON RESERVE PORTION.

Rate of Flow.	Gm. Total Alkaloids in Reserve Portion.		Gm. Total Extractive in Reserve Portion.	
	No Maceration.	48 Hours' Maceration after Packing.	No Maceration.	48 Hours' Maceration after Packing.
0.5 cc. per minute	8.95	9.97	53.0	54.8
1.5 to 2.5 cc. per minute	8.77	9.30	53.7	50.2

The efficiency of extraction of the alkaloids of nux vomica was increased slightly by the 48-hour period of maceration after packing and also by percolating at the slower rate.

SUMMARY.

Maceration before packing is of no importance in increasing the efficiency of extraction of belladonna root in a percolation process; maceration after packing causes a slight increase in efficiency of extraction of total alkaloids and total extractive. Experiments on yellow cinchona and nux vomica also tend to show that maceration after packing increases the efficiency of extraction to a slight extent.

Slow percolation gave slightly more concentrated percolates than rapid percolation in case of nux vomica and yellow cinchona. Percolation of belladonna root at a moderate rate gave just as efficient extraction as the slower rates tested.

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THE DETERMINATION OF ALCOHOL IN PHARMACEUTICAL LIQUIDS. I. A STUDY OF THE U. S. P. X AND U. S. P. XI METHODS.

BY KARL BAMBACH AND T. H. RIDER.

The United States Pharmacopœia IX (2) was the first edition to carry a method for the determination of alcohol in liquids, and the method stated there was repeated without significant changes in the U. S. P. X (3). The method is based upon the well-known procedure of distilling the alcohol from the sample and determining the specific gravity of the distillate. Then by reference to the proper tables the alcohol percentage of the original sample can be found. Volatile sbustances other than alcohol and water which would affect the specific gravity are directed to be removed in so far as possible by saturating the distillate with sodium chloride, shaking it with petroleum benzin, and then redistilling the aqueous portion. This procedure is definitely time-consuming and the new U. S. P. XI method (4) is somewhat shorter and simpler, consisting of adding saturated sodium chloride solution to the sample, shaking it with petroleum benzin, and distilling the aqueous portion.

It is similar to the A. O. A. C. method (1). When troublesome emulsions are formed in the shakeout a double distillation very similar to the U. S. P. X method is used.

The authors have long questioned the accuracy of the methods when interfering volatile substances are present, and have felt that the procedures are unduly time-consuming for routine work. An analytical method is at a double disadvantage when, in addition to being lengthy, it is not particularly accurate, and therefore a speedy, reliable official method is badly needed.

EXPERIMENTAL.

In order to test the accuracy of the methods, measured samples of known alcohol-water mixtures were contaminated with various volatile substances commonly found in official products and attempts were then made to determine the alcohol content of the original alcohols by the U. S. P. X and U. S. P. XI methods. The details of the procedures follow:

The specific gravities of the alcohol-water mixtures were carefully determined by the pycnometer and the alcohol contents found by reference to the proper tables. Certain quantities of chloroform, volatile oils, or soap were added to measured samples of these known alcoholic mixtures. In case the U. S. P. X method was to be followed, the sample containing the contaminating substance was distilled, the distillate saturated with sodium chloride, shaken with petroleum benzin and redistilled, and the specific gravity of the second distillate was determined. In case the U. S. P. XI method was to be followed the sample of the known alcohol was measured directly into a separatory funnel, the contaminant added, and then the shakeout and distillation were completed. In every case the official instructions were followed exactly, using the prescribed quantities of water, petroleum benzin and saturated sodium chloride solution.

Samples of known alcohols were also distilled directly in order to test the efficiency of the distillation apparatus, which consisted of a 500-cc. short-neck Kjeldahl flask, a Kjeldahl trap, and a 12″ spiral condenser. City water at a temperature of 20–25° C. was used in the condenser.

TABLE I.

Contaminant.	Sample of Known Alcohol. Cc.	Correct Alcohol Content %.	Alcohol Content Found. U. S. P. X Method %.	Alcohol Content Found. U. S. P. XI Method %.
0.5 cc. oils for Flext. Cascara Aromatic (anise, cinnamon, coriander, methyl salicylate)	50	17.5	16.9	17.0
			16.6	16.7
1 cc. Chloroform	50	17.5	16.8	16.7
			17.1	16.6
0.15 cc. oils for Elixir Aromatic (orange, lemon, coriander, anise)	50	17.5	16.3	17.1
			16.5	16.8
1 cc. Chloroform	25	50.0	48.2	49.1
			48.4	48.7
1.5 Gm. Powdered Soap and 0.5 cc. Oil Rosemary (and excess sulphuric acid)	25	50.0	48.6	49.4
			48.6	49.2
0.12 cc. oils for Aromatic Spirit of Ammonia (lemon, lavender, myristica)	10	77.8	75.5	..
			75.0	..
0.3 cc. oils for Aromatic Spirit of Ammonia	25	77.8	..	76.2
			..	76.6
None, but using the petroleum benzin shakeout as if a contaminant were present	25	50.0	..	49.7
	25	77.8	..	77.2

TABLE II.

	Size of Sample. Cc.	Correct Alcohol Content %.	Alcohol Content Found %.
Single, direct distillation, without shakeout	25	77.8	77.6
			77.8
Distilled twice, without shakeout	25	77.8	77.6
			77.5

DISCUSSION.

It is clear that the U. S. P. X and U. S. P. XI methods of determining alcohol in pharmaceutical preparations when volatile substances are present give low results and that only slight loss occurs due to the shakeout alone (Table I). It has been shown (Table II) that even with non-chilled condenser water the loss on simple double-distillation is slight. In addition to being inaccurate the methods consume considerable manipulative time; the U. S. P. X procedure is the worst in this respect.

The U. S. P. X required that a 10-cc. sample be taken with alcohol percentages above 50%; since the final distillate had a volume of 50 cc., this meant that the alcohol percentage of the distillate was multiplied by five in order to get the alcohol content of the sample. This, of course, introduced a large factor with which to multiply the already noticeable errors. The U. S. P. XI method is an improvement in this case, since it requires that a 25-cc. sample be taken for all alcohols above 30%. However, it would have been more consistent to have stipulated that a 25-cc. sample be taken for all alcohols above 40%, since a 50-cc. sample of a 40% alcohol contains the same quantity of ethyl alcohol as a 25-cc. sample of an 80% alcohol. If the U. S. P. XI method works with 25 cc. of an 80% alcohol, surely it should work with 50 cc. of a 40% alcohol. This has been checked experimentally, and it was found that no detectable loss occurred when a 50-cc. sample of a 40% alcohol was distilled into a 50-cc. flask.

The U. S. P. XI directions state,

> "If volatile oils are present in small proportions only, and a cloudy distillate is obtained, the benzin treatment not having been employed, the distillate may be clarified and rendered suitable for the specific gravity determination by shaking it with about one-fifth its volume of purified petroleum benzin, or by filtering it through a thin layer of purified talc."

Shaking the distillate with benzin or filtering it through talc *after it has been made to volume* and just before the specific gravity determination should not be permitted. It is contrary to any good analytical technique; the objections to it so far as correct analytical procedures are concerned are so obvious that they need not be mentioned here. In addition, we have tried filtering certain cloudy distillates and frequently the results are far from correct. In the case of Fluidextract Cascara Sagrada Aromatic, for instance, our results have been low; in some other cases the results have been high. If the portion of the volatile substance soluble in the distillate has a high specific gravity, of course the apparent alcohol percentage will be low. In the interest of good analytical procedures, both theoretically correct and giving accurate results, the authors are definitely opposed to the inclusion of this paragraph in the description of the official method.

We do not wish to give the impression that this study has resulted in destructive criticism only, and that we have nothing constructive to offer. The authors have worked out a new method of determining alcohol in pharmaceutical preparations which is based upon the distillation being carried out in a simple, special apparatus in such a way that all volatile substances which would otherwise have to be shaken into petroleum benzin are automatically removed in the distillation. The method gives correct results in all of the cases listed in this paper where the official method gave inaccurate results. The procedure will be described in a later issue of THIS JOURNAL.

We wish to acknowledge the technical assistance of Miss Dorothy E. Wolf in this study.

SUMMARY.

The U. S. P. X and U. S. P. XI methods for the determination of alcohol in pharmaceutical liquids when other volatile substances are present are both time-consuming and inaccurate. In some respects the U. S. P. XI method is an improvement over that of the U. S. P. X but both methods tend to give low results.

A new method of assaying for alcohol has been worked out which is rapid and accurate; it will be reported later.

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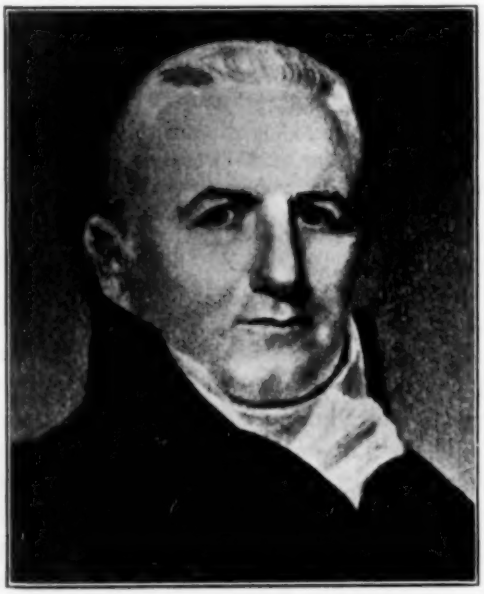

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THE ORIGIN AND ORGANIZATION OF THE U. S. NAVY HOSPITAL CORPS SCHOOL, PORTSMOUTH, VIRGINIA.*

BY M. A. STUART.[1]

Years ago when life was much less complicated than it is to-day, nursing in civil life was dependent upon the services of women who, by their temperament, attitude and association with the sick, were regarded by their community as the personification of the last word in nursing.

Aboard ship in the old Navy of "wooden ships and iron men" medical attention was rendered by the ship's surgeon assisted by surgeon's mates, who were more or less in the relationship of preceptor and student, and by men from the ship's company who were assigned to duty with the surgeon. The latter had little if any nursing or medical knowledge and their ultimate proficiency depended almost entirely upon the instruction they received from their officers and their experience with the sick aboard ship. With the development of medicine and surgery and the evolution of the hospital, the modern training school and the efficient graduate nurse of to-day appeared. Obviously, female nurses are not suited for service aboard combatant ships. In keeping with the trend of the times, however, better treatment of the sick in the Navy became necessary and resulted in the organization of the Hospital Corps in 1898. Likewise, the need of a more comprehensive, thorough and systematized course of instruction became imperative and led eventually to the establishment of the institution now known as the U. S. Navy Hospital Corps School, Portsmouth, Virginia.

Evolution of the Hospital Corps.—Coming into existence during the Revolutionary War, the U. S. Navy was virtually disbanded by July 1785. Depredations by the Barbary Corsairs upon the commerce of the United States resulted in the construction, through an Act of Congress, of three ships which were completed in 1797. The Constitution or "Old Ironsides" was one of these ships, and having been rebuilt several times, is still in existence. This act also provided for the appointing of surgeons and surgeon's mates, thus forming the anlage of the Medical Corps and the Hospital Corps of the United States Navy. Congressional legislation enacted on March 3, 1901, and April 21, 1906, provided for a peace time organization, thereby firmly establishing the U. S. Navy as a permanent public service. We now come to the real precursor of the modern hospital corpsman, the "loblolly-boy," a term formerly applied to gruel or porridge. Old regulations provided that "a surgeon shall be allowed a faithful attendant to issue under his directions, all supplies of provisions and hospital stores, and to attend the preparation of nourishment of the sick." Thus from his connection with the preparation of porridge for the sick this "faithful attendant" gradually earned the appellation of "loblolly-boy" which, according to his proficiency in the culinary art, became either a term of endearment or reproach or worse.

The term "Steward" as applied to attendants of the sick first appeared about the time the Bureau of Medicine and Surgery was organized in 1842. Men of this title or rating were called "Hospital Stewards" at hospitals, where the position was

* Section on Historical Pharmacy, A. PH. A., Portland meeting, 1935.

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one of dignity, and "Surgeon's Stewards," aboard ship. Additional attendants for the sick were detailed as needed from landsmen employed in the waist of the ship and known as "waisters."

In 1861, the loblolly-boy dropped out of the picture and was replaced by a man holding the rate and title of "nurse." In 1863, the title "Surgeon's Steward" was changed to "Apothecary" and about 1873, the term "nurse" was changed to "bayman," so-called from his association with the sick-bay which, in the old wooden ships, was a space or bay on the main deck between two gun ports.

With the establishment of the Hospital Corps in 1898, the title "Apothecary" was changed to "Pharmacist" for the warrant grades while, for enlisted personnel, the old title "Hospital Steward" again appeared for the chief petty officer grade. Other enlisted ratings were Hospital Apprentice, first class (petty officer, third class) and Hospital Apprentice. In August 1916, the three ratings were changed to the present enlisted grades of Chief Pharmacist's Mate (chief petty officer), Pharmacist's Mates, first, second and third classes (first, second and third petty officers, respectively) and Hospital Apprentices, first and second class. For a long time, members of the Hospital Corps had not fully approved of the title "Steward" as it smacked too much of the culinary or mess-men branch and did not clearly indicate the true character of their responsibility.

Development of the Hospital Corps School.—The establishment of the Hospital Corps in 1898 created for the first time an organization to which a system of training and discipline could be given with reasonable hope of success.

Under the title "School of Instruction, Hospital Corps, U. S. Navy," the first formal course of instruction for members of the Corps was started on August 11, 1902, at the Naval Hospital, Norfolk, Virginia.

The course extended over a period of three months, later increased to four months, with six hours a working day devoted to instruction. Upon graduation, the men were transferred to the various naval hospitals for practical experience and then to general service.

After about thirteen classes had been graduated, it was realized that the available space at the Norfolk Hospital was inadequate and with plans in course of preparation to rebuild the hospital, the school was transferred in 1907, to the old naval hospital in the southeast section of Washington, D. C., which had been vacated upon the completion of the present hospital near the Lincoln Memorial.

Largely because of the shortage of men in the hospital corps, it was decided, in 1910, to send all hospital apprentices after enlistment direct to Naval Training Stations for general training except that first-aid and special instruction supplanted gun drills and target practice. Those who survived the weeding out process were assigned to the medical departments of the various ships and to the hospital ship where their instruction was continued.

At the end of a year's service afloat, the men were sent to the naval hospitals at New York, Norfolk, Mare Island, Calif., and Canacao, P. I., for practical training under the guidance of members of the Navy Nurse Corps (female) which corps, it may be stated, had not been organized until May 1908. In accordance with this new policy, the Hospital Corps School, Washington, D. C., came to an end in January 1911, with the graduation of the twentieth class since the school was first organized at Norfolk.

With most of Europe embroiled and with the probability of the United States being drawn into the conflict of the World War, a hospital corps training school was opened at San Francisco, California, in 1915, and another at Newport, R. I. In preparation for actual hostilities, two additional schools were opened in 1917, one at Great Lakes, Illinois, and the other at Hampton Roads (Norfolk), Virginia, and the hospital corps increased in strength from 1505 in 1916, to 7000 in 1917, and to a total of 14,718 in July 1918. Figures relating to war-time activities of these schools are shown in the following table.

School.	Normal Capacity.	Average Emergency Capacity.	Greatest Number at Any One Time.
Newport, R. I.	250	500	900
Great Lakes, Ill.	300	1500	2200
San Francisco, Cal.	250	500	900
Hampton Roads, Va.	300	300	300

After the war the Hospital Corps schools at Great Lakes and San Francisco were closed and the one at Newport consolidated with the school at Hampton Roads. Another school to furnish trained personnel for West Coast activities was opened at the Naval Hospital, San Diego, Calif., in September 1928, but with the reduction of the Navy during the "Great Depression" it was discontinued on June 1, 1932, and but recently has been re-opened.

The Hospital Corps School, Norfolk, Va.—Located near a port of embarkation, the special function of the Hospital Corps School at Hampton Roads was to give advanced work to rated men with some experience and foundation and train them for service aboard transports and particularly for independent duty aboard overseas cargo carriers, hence the name was changed to the U. S. Navy Pharmacist's Mates School. The merging of the school at Newport after the close of the World War with the Pharmacist's Mates School, Hampton Roads, added a third course, the basic, primary or preparatory course for the hospital apprentice to the curriculum of the school. There was then consolidated in one institution for the first time, the equipment and personnel for the instruction and training of all groups of the personnel of the Hospital Corps of the Navy.

In December 1920, the school was transferred back to its original location at the Norfolk Naval Hospital, Portsmouth, Va., and in 1929, the name was changed to its present title "U. S. Navy Hospital Corps School."

Equipment.—When the school was transferred back to the Norfolk Hospital it was housed in a group of 13 buildings in the far northwest corner of the reservation. These buildings, of hollow tile and of the semi-permanent type of construction, were erected at the beginning of the World War as an extension of the hospital proper, were gradually vacated after the armistice, and were unoccupied at the time they were assigned to the school. All but one, the mess hall, now the hospital laundry, are two stories in height. Although built some sixteen years ago, they are in a fairly good state of preservation to-day and are ideal for school purposes.

At the present time, the plant consists of the administration building, the two buildings housing the laboratories and class rooms, and two dormitory buildings. Other buildings are available for dormitories and can be assigned to that purpose upon a few minutes' notice. The buildings are heated by steam and lighted by electricity from a central station which reduces fire risk and ensures continuity of

service. Students are subsisted in the general mess of the hospital and march to and from their meals in formation. The building which formerly served as mess hall and commissary has been converted into a laundry and shops for the hospital. All recruits now admitted to the school have passed through the detention period and have received their preliminary instruction at the various training stations where they are given their outfit of Navy clothing and vaccinated against small-pox and typhoid fever. Each lecture room provides seating accommodation for about 90 men. The laboratories are roomy and well equipped. Chemical, pharmaceutical, bacteriological (including microscopes) and other apparatus have been provided by the Bureau of Medicine and Surgery in ample quantities for the purpose intended.

Administration Policies.—The instruction in the school is largely theoretical and, because of the limited time available, every effort has been made to concentrate upon essentials and to endeavor to standardize courses so that each subject follows in a logical sequence. There are certain basic facts which must be mastered before the student can become an efficient hospital corpsman and the faculty endeavors to teach these fundamentals through the use of appropriate apparatus or demonstrations upon manikins or members of the classes themselves. Practical instruction at the bedside and in the operating room and experience in the actual treatment of the sick must, of necessity, be acquired by the students subsequently at naval hospitals and in general service.

Discipline of some sort or other and by whatever name it is called, is enforced in every school and organization worthy of the name. In the Navy, the fundamental rules of discipline which make obedience a matter of habit are instilled into the recruit at naval training stations and this process is continued at the school. Students are treated as men and not children and are given such responsibility as they can assume. If and when punitive measures become necessary they are reasonable and fair and awarded to actual offenders, not to the class as a whole. Special privileges are granted as a reward for good work, while those who cannot stand prosperity receive none or forfeit such privileges if granted before they demonstrate their unworthiness. Backward but conscientious students are given encouragement and special attention but those whom the majority of the faculty regard as unsuitable material are recommended for transfer to other duty.

The Virginia State Board of Examiners of Nurses, placed the school on an accredited list in February 1924. This entitled applicants who were graduates of the school and who had completed a four full years' enlistment in the Hospital Corps to registration in the State of Virginia by examination.

The Personnel Office.—This office is the respository for all records, schedules and other papers. Its files contain the scholastic records of all students who have graduated since the school was transferred to its present location. Statements showing the work performed by each student, together with the grade attained, are given to this office by the instructors bi-weekly and at the end of each four-week period. From these marks the final average for the entire course is computed. Relative standing at graduation is therefore competitive and stimulates the student to apply himself. The final average is entered on each diploma. Students attaining a general average of 95 or above are classed as "Honor Graduates." Scholastic records are also of value in assisting students to secure employment after they leave the service. The number of requests for transcripts and recommendations received

in the course of a year from corporations, Nursing Bureaus and other agencies to whom graduates have applied for employment has been surprising.

Athletics.—Students have always been encouraged to engage in athletic sports not only on the assumption that a healthy mind and a healthy body go hand-in-hand but also because athletics tend to make a student more contented, to increase the morale of the individual and of the school, to foster a better school spirit and to dispel the humdrum monotony of ordinary routine. A member of the faculty who has shown unusual aptitude in developing the best in athletics devotes part of his time to this work.

COURSES OF INSTRUCTION.

Students entering the school must, obviously, have a sufficient educational background to properly comprehend and assimilate the work given them. Thus a man who understands neither decimals nor fractions can hardly be expected to do much with weights and measures in the time allotted. Ordinarily those selected for the course of instruction should have had two years of high school work or its equivalent and are given a written examination and intelligence test at the training station prior to selection.

The commanding officer of the Naval Hospital is also in command of the Hospital Corps School, and in addition, one medical officer, two Chief Pharmacists (commissioned warrant officers), five Chief Pharmacists' mates, two Pharmacists' mates, first class, and one member of the Navy Nurse Corps are attached to the school as instructors.

The elementary or Basic Course extends over a period of sixteen weeks. Classes are held each day except Friday afternoons, Saturdays, Sundays and holidays between the hours of 8:00 A.M. and 12:00 noon, and 1:00 P.M. and 3:00 P.M. The period from 3:00 P.M. to 4:00 P.M. is given to drills while Friday afternoon is devoted to the preparation of buildings, equipment and personnel for inspection by the medical officer in charge on Saturday mornings. Practical work in laboratories is given during the fourth month.

Subjects taught and hours of instruction are shown in the following table:

	Hours.	
	Practical.	Theoretical.
Anatomy and physiology	..	56
Hygiene and sanitation	16	40
Pharmacy (*a*)	36	36
First aid and minor surgery (*b*)	36	36
Materia medica	20	60
Nursing (*c*)	40	40
Laboratory (*d*)	16	16
Hospital Corps drills	64	..
Total	228	284
Grand Total	512	

(*a*) Includes weights and measures.
(*b*) Includes bandaging and application of splints.
(*c*) Includes dietetics.
(*d*) Includes bacteriology, hematology and urinalysis.

All work is based upon the Hospital Corps Handbook, United States Navy, which is used as a textbook, while the faculty have ready access to recently published works of reference in the school library. Additional books are furnished by the Bureau of Medicine and Surgery as required.

Anatomy and Physiology.—The first two periods in the morning during the first month and the first period in the afternoon during the second month are devoted to this subject, making a total of 56 hours of instruction. In order that practical demonstrations may be given with the lectures the class room is equipped with an articulated skeleton, wax models and numerous enlarged charts of the various organs and parts of the human body. It is impressed upon the men that the time allowed only gives them a groundwork in the subject, and in order to gain advancement in their rating they must continue their studies after graduation and improve themselves in the details.

Hygiene and Sanitation.—A total of 56 hours is apportioned to this interesting subject. Instruction is given in personal hygiene, ventilation with reference to the effects of temperature, humidity and circulation of the air, heating, lighting, clothing and sewage and refuse disposal. Field sanitation is fully discussed as is personal hygiene of the march with special attention to the care of the feet. Preventive medicine occupies a prominent place in this course and considerable attention is given to the modes of transmission of communicable diseases and methods of control, relation of pathogenic micro-organisms to disease, epidemics, disinfection and disinfectants, the principles of isolation and maritime quarantine. Insect-borne diseases are studied with reference to the manner of spread and, moreover to the habits, breeding places and destruction of the transmitting agents. Destruction of insects, rodents and vermin in general is also taken up. In so far as time permits, consideration is given to susceptibility and immunity, vaccination and immunization and to the prevention of the common communicable diseases.

Chemistry.—The short time allotted to chemistry (40 hours) permits of instruction only in the most basic principles of this subject. Even the little time devoted to the subject, however, is found to be of great value to the student both during his period of instruction and after he has been returned to the general duties of a hospital corpsman. The period allotted to chemistry comes in the first month and hence precedes the study of Pharmacy, Materia Medica and laboratory methods. After elementary basic principles are taught, the student is introduced to volumetric solutions and titration, and the last week of the course is devoted almost entirely to practical work along this line.

Pharmacy.—At shore stations and aboard ship the dispensary or pharmacy is in the charge of a man in one of the higher ratings and with long years of service and experience. It is not expected that this school will turn out experienced pharmacists but it does give the man a general course in the principles of pharmacy such as will equip them to act as assistants under the supervision of a trained pharmacist. The course in pharmacy covers a period of eight weeks of two hours a day. Of this, the first two weeks are devoted entirely to weights and measures as experience has shown that this particular part of pharmacy is one of the most difficult for new students to understand. Such experience, it might be added, is not confined to this school. While the Medical Department of the Navy uses the metric system there are, frequently, occasions when it is necessary to convert from

the apothecary's to the metric system and this seems to present the greatest difficulty to the inexperienced student. The course includes theoretical and practical pharmacy based upon the U. S. Pharmacopœia, National Formulary and the Dispensatory, general precautions in regard to dispensing, and practical work in making pharmaceutical preparations and in filling prescriptions.

First Aid, Minor Surgery and Bandaging.—Men of the Hospital Corps of the Navy are expected to be proficient first aid men. Special attention is given to this subject at the Hospital Corps School. The course covers a period of eight weeks, two hours a day being devoted to this particular subject. Of this sixteen hours are devoted to practical bandaging. Other subjects discussed and demonstrated are artificial respiration, the treatment of shock hemorrhage, wounds, sprains and fractures and first aid in medical and surgical diseases and conditions.

Nursing.—Students taking the elementary course are young and have had very little, if any, contact with sickness and sick people so that it is necessary to give a very minute and detailed description of all procedures. Professional etiquette and obligations are discussed and the value of honesty, truthfulness, faithfulness, obedience and courtesy impressed. Students are shown the practical application of what they have learned in other preceding courses. For instance, having learned about the importance of cleanliness, ventilation, the prevention of disease and its spread and disinfection in Hygiene and Sanitation, they are now shown the application of these measures to the care of the patient and to his surroundings.

Practical demonstrations are given in making the various kinds of beds such as open and closed beds, fracture beds and ether beds. The model ward makes an ideal class room for this purpose. A dummy is useful in showing how to make a bed holding a helpless patient. Bathing of bed patients and administration of enemata are demonstrated using students as patients. Fowler's position is shown by means of a Gatch frame and the advantages explained. Pre-operative and post-operative care are gone into in detail, as are lavage and gavage. Students are taught the various methods of adding to the comfort and well-being of the sick such as alcohol rubs, changing of position, and the care of the mouth and back. The proper care of furniture, linen, rubber goods and other articles of hospital equipment is discussed.

The importance of hypodermic medication is recognized and each student is required to give a hypodermic injection. They are also instructed in the preparation for and the precautions to be used in assisting in hypodermoclysis and the administration of drugs by the intravenous method.

In the practical demonstration of catheterization and the application of surgical dressings, the hospital corpsmen are trained in the practice of asepsis, a difficult subject for one who is not familiar with it to understand.

Having studied counterirritants as drugs in Materia Medica, the students are now taught the proper application of these drugs, and other agents such as heat and cold, in the treatment of disease and the dangers connected with their use.

Instruction in dietetics consists more in the proper manner of serving food than in the theory of food values, though the subject of food values and a balanced diet are discussed. Especial emphasis is laid upon variety for a patient on liquid diet and how to prepare various kinds of fluid nourishment. The relation of food to the deficiency diseases is also discussed.

Corpsmen practice on each other in taking their temperature, pulse and respiration. The findings are recorded on charts. They are also trained in observing and recording symptoms. Accuracy and neatness are stressed. Emphasis is placed upon the types of respiration and the quality of the pulse.

To acquaint students with the materials required, trays are equipped with outfits for twenty-four different routine procedures and their use demonstrated before the class.

Materia Medica.—The time allotted to this course is divided into 40 lecture periods of 2 hours each or a total of only 80 hours. It is obvious that only the most common drugs can be studied. Since it appeared undesirable to devote valuable time to the detailed description of crude substances which the hospital corpsman might not see during his future naval career, instruction is largely confined to the drugs listed on the supply table of the Bureau of Medicine and Surgery. The Hospital Corps Handbook is supplemented by the United States Pharmacopœia, National Formulary, United States Dispensatory and other recognized works. Instruction is given in as vivid a manner as possible in order to lay a firm foundation and to stimulate interest and future study in this subject.

Clinical Laboratory Procedures.—Obviously, it is neither necessary nor desirable that all men of the Hospital Corps be laboratory workers. It is very desirable, however, in fact absolutely essential, that every Hospital Corpsman be trained in the ordinary routine laboratory procedures which he might be called upon to do from time to time while in the service. With this in mind the following curriculum is used at this school during the last month of the course on four afternoons a week from 1:00 P.M. to 2:00 P.M., for a total of 32 hours.

The men learn by practical work in the laboratory the use and care of the microscope, the difference between chemical and bacteriological cleanliness, certain elemental chemical and bacteriological procedures and the fundamentals of hematology and urinalysis. The preparation of the various types of bacterial culture media is demonstrated before the class and each student inoculates culture tubes with the more common bacteria, observes the growth of the culture and makes transplants and stained smears. Each student also makes blood cell counts, makes, stains and examines blood smears and stains and examines thick and thin blood smears received from cases of malaria in the tropics.

Thus it will be seen that the Basic Course as given in this school covers a variety of subjects and is as comprehensive as the time allotted will permit. It is believed that the course lays an excellent foundation for the hospital corpsman to build upon but his future development depends, as well as in other walks of life, upon the interest he shows in his work and his will to go ahead. If he possesses these qualities he should, with the practical instruction received later at a hospital, develop into an efficient hospital corpsman and be well on his road to promotion and even greater possibilities. It may also be stated that the Bureau of Medicine and Surgery requires continuous and progressive theoretical as well as practical instruction of hospital corpsmen at hospitals, naval stations and aboard ship.

REFERENCE.

"A Century with Norfolk Naval Hospital" (1930), by R. E. Holcomb, Captain (M.C.), U. S. Navy (Ret.).

PRACTICAL PHARMACY AS PRACTICED IN FREE HOSPITAL AND CLINIC OF JEFFERSON DAVIS HOSPITAL OF HOUSTON, TEXAS.*

BY F. N. BONO.[1]

In presenting this story from behind the scenes of a Hospital Drug Room, which also serves as a free clinic for a city of some three hundred thousand population, Houston, Texas, where 18 clinics meet in the Drug Room, the author will endeavor to record as simply as is possible the duties and practices that are almost daily routine. This work calls for the maximum in efficiency, accuracy and honest endeavor.

For the last 18 years drugs have been given to the poor of Houston through the clinics, on prescription only; but a few months ago it became necessary to make a small charge, not exceeding 25 cents, coded by A to F on prescriptions—A is no charge, from B to F there is an increase of five cents, making F the maximum of 25 cents. This rating is made according to the salary received by the patient. Most of the prescriptions come through as A and a very few as F: many are marked B, which is a charge of 5 cents per prescription. Some of the blanks carry more than one prescription. The rating is given by a clerk who has access to the charts. This clerk's office is marked No. 2; then the patient takes the prescription to another clerk at office No. 3, who collects and stamps the prescription as paid; also marks it paid if there is no charge, which indicates that the prescription has been o.k.'d for filling. The patient is given a drug number by the call clerk or one of the two registered pharmacists; this number must be returned the same day by 5:00 P.M.

During clinic, from 15 to 25 prescriptions are taken in at a time, issued in a bunch by the call clerk who only calls out the Drug Room prescription number, which is written on the prescription for that day only and if more than one prescription, the same number appears on each label of the medicine in the upper left-hand corner. There are two windows from which patients are served, one for the white patients and the other for colored. Numbers begin with 200 to 400 and 300 to 500, in order to have no conflict with clinic numbers, which begin with 1 on up to 300 to 500 per day. So far there has been no conflict in calling the same numbers. Another reason for the smoothness of this number system is that the numbers are not consecutive as in the clinic. The number system is good, it is almost impossible for an error of delivery to be made, because as the number is issued it is written on the prescription in sight of the patient, who has learned to check his number. After the patient receives his number, he has the privilege of waiting for the prescription or calling for it later; it is preferred that the patient wait, as it obviates additional work.

In a clinic like this, speed is of importance; therefore all prescriptions are filled as promptly as possible. All prescriptions filled are coded, if possible, and placed next to the patient's issue number. This code is used in refilling and as a check against error.

The prescriptions are inverted as they are taken in so they can be issued with the least delay to the patient; in other words, first come, first served, whenever possible. One of the pharmacists takes all of these prescriptions, beginning with the bottom one first and writes labels for them according to the directions thereon, and wherever possible, affixes a code for the pharmacist only. This code, or part of it, is given in a formulary used by the clinic and the hospital. Some prescriptions that cannot be coded are not refillable. Most of the prescriptions are supposed to come from the clinic and hospital formulary either by number, code or writing the prescription as found in the book. The code is preferred. As fast as the labels

* Section on Practical Pharmacy and Dispensing, A. PH. A., Portland meeting, 1935.

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are written, the prescriptions are filled from the coded labels. Perforated gum labels are used. Twelve labels $1^1/_2$ by 2 inches to a sheet and only six are written on one side before any are detached. The labels of the entire sheet are detached and placed upside down in a container where they remain until taken up for filling. When a smaller label is required, it is cut down after it has been written. There are two moisteners to take care of these labels. On the prescription counter there is a stack of labels instead of prescriptions. In a few minutes many rows of filled prescriptions will be on either side of the pharmacist, in the order that they came in. To his right are the odd numbers for the colored patients and to his left are the even numbers for the white patients. The call clerk calls the numbers at the proper window which is checked by the number of the patient that has been issued to him. The call clerk must keep up the stock of filled prescriptions such as cough syrups, pills, etc. The pharmacist attaches the label and checks them; no time is lost, for many are waiting for their medicine, and the sooner they leave the window the better it is for those coming after them. Many prescriptions have to be compounded immediately and these usually are the ones that cannot be coded. Wherever possible, they are filled as soon as possible, as they require more time. Most of the prescriptions, of course, are compounded in advance and placed in proper containers by the call clerk for future use. He usually fills a whole carton of containers as he finds time to do so. Not all prescriptions can be filled and shelved, as they require extra time in filling and compounding.

Sixteen one-pint graduates, with extra long lips, must be in readiness with preparations therein for that day only. The gallon bottle is beneath this shelf and near to the graduate for speeding the dispensing. These graduates are placed in a long straight row with enough space for easy handling, with the code at the foot of each graduate. No two preparations of the same color are permitted to stand side by side. This is another way to avoid errors and to speed the work. These graduates are emptied each evening into the gallon bottles. The preparations therein are as follows: (Note color and code.)

Mineral Oil (Mo), clear; Cascara (Cs), black; Dobell's (Do), clear; Anti Rheumatic (Ar), dark amber; Solution Bromide (Br), clear; Diuretic (D), medium amber; Solution Pheno-barbital (Pbs), red; Elixir I. Q. S. (T), greenish; Cough Syrup (C), reddish brown; Liniment (L), pale amber; Narcotic Diuretic (NcD), dark; Cod Liver Oil (Clo), clear; Calamine Lotion (Cl), cloudy pink; Brown Mixture (Bx), muddy brown; Vincent's Gargle (Vg), faint amber; and Milk of Magnesia (M), milky. These are used often and any combination can be made without going to the bottle. As an example, the doctor orders Cascara and Milk of Magnesia mixture; pour out the right amounts from the graduates into the prescription bottle, and the prescription is filled. All of the prescriptions from the book are for simple drugs. Very few proprietaries are used. Most preparations are of our own make and formula, or of the U. S. P. and N. F., which are also made by us when possible. The monthly average of 26 days of prescriptions filled is about 15,000 and preparations manufactured by us over 1900 per month. Prescriptions per day run around 500 to 600; one time 998 prescriptions were filled which required an extra hour.

The drug room hours are from 8:00 A.M. to 12:00 noon and 1:00 P.M. to 5:00 P.M. No one is allowed in the drug room. No prescriptions are received over the telephone except on real emergencies. Pharmacists are subject to calls after hours only when there is an emergency. Outside of drug-room hours, all emergency prescriptions are filled from a cabinet in the emergency room by the emergency doctor who carries the key and leaves a prescription for the same. The cabinet contains

about 20 prescriptions that will meet most any emergency case or hold the patient over until the clinic opens. The cabinet is kept up daily by the drug department, also vaccines and serums, for when the pharmacists leave, the drug room is locked.

Most of the preparations are of hospital formulas which are made up in pints, quarts, gallons, pounds, 5 pounds, 25 pounds and 50 pounds. Very few pharmaceuticals are purchased. The following preparations will give an idea of the amounts used per month, that are mostly dispensed on prescriptions. (Note code and part formula.) Fifteen gallons Diuretic (D)—20 grains of potassium acetate to the drachm, colored with cascara, to medium amber; ten gallons solution phenobarbital (Pbs)—1/4 grain to the drachm; Elixir I. Q. S. 10 gallons (no sugar) (T); 10 gallons Dobell's Solution (Do); 15 gallons Anti Rheumatic (Ar)—15 grains sodium salicylate, 5 grains potassium acetate to the drachm, colored with cascara to dark amber; 10 gallons solution sodium bromide (Br)—20 grains to the drachm; 10 gallons Cough Syrup (C) colored with red and caramel; 5 gallons Liniment (L)—contains oil of mustard and known as snake oil; 5 gallons (NcD) Narcotic Diuretic—contains 5 drops of tincture of opium to the drachm, also known as G. U. Sedative; 5 gallons Calamine Lotion (Cl) no phenol; 5 gallon Vincent's Gargle (contains Fowler's solution) Vg; 35 pounds of Sippy's powder; (No. 1) 1 Magnesium oxide and 3 Soda (known as alkaline powder); 25 pounds Sippy's powder No. 2 (No. 2)—1 Calcium Carbonate and 3 Soda; 25 pounds Gc Douche powder (contains menthol) (Gc); 45 pounds scabies ointment (Sc)—contains precipitated sulphur; 45 pounds of Ammoniated Mercury Ointment (Am); 15 pounds Whitfield's Ointment (Wo)—contains salicylic and benzoic acids; S. S. K. I. (Saturated solution potassium iodide) 2 gallons with 20 grains of sodium thiosulphate added to prevent discoloration (Ki); 2 gallons vanilla flavor, mostly for kitchen; 1 pint orange flavor for drug room only; 4 gallons Tincture of Iodine; 10 gallons Theobromine and Phenobarbital (ThPb)—1/4 grain of phenobarbital, 7 1/2 grains theobromine-sodium salicylate to the drachm; 1 gallon Diluted Hydrochloric Acid; 75 pounds Unna's paste (paint) for surgical boots (contains 1/4% phenol). The Unna's paste and Elixir I. Q. S. are the most difficult to make, as both require heat and much time to make them into elegant preparations. Heat must also be used with Iodine Ointment, Analgesic Ointment and Camphorated Oil. Usually 37 1/2 pounds of Unna's Paste is made up at a time with 1/4% phenol added as a preservative and placed in empty one-pound Dextri-Maltose cans.

There is no machinery. All preparations are made up by hand. It has been said that our department has learned to do as much with an ice pick, a spoon and other household utensils in the pharmaceutical laboratory as others who have expensive and elaborate equipment.

It costs the drug department about $2200.00 per month for its drug items, including vaccines, serums and containers. The following purchased items are used per month: Ten cases of 24's 1-lb. Arm & Hammer Soda; 2 gallons red coloring; 300 pounds boric acid, powdered; 15 gallons glycerin; 120 gallons alcohol; 30 pounds liquid phenol; 16 dozen tetanus anti-toxin, 1500 unit vials; 160 vials insulin, U 40–10 cc.; 15 gallons mineral oil; 5 gallons aromatic cascara; 10 gallons milk of magnesia; 30 gallons liquor cresolis compositus; 10 cs 12's 6 ounce yeast powdered; 28 × 2 ounce jars of bismuth salicylate cream; 48 × 3 Gm. arsphenamine ampuls (these two items are used in venereal clinics); 4 pounds silver nucleinate (Agl); 10 gallons cod liver oil; 12 × 50 cc. vials perferingens anti-toxin, procaine hydrochloride 3/4 pound and sodium phenobarbital, powdered 1/2 pound.

The purchased items run over 600; 220 are chemicals, 19 vaccines and serums, 21 acids, 20 hypodermic tablets, 79 ampuls, which include some vials for hypodermic use only, 26 fluidextracts, 63 tablets and pills (different sizes of same not included), powdered crude drugs, few tinctures, fixed oils, essential oils, magmas, few proprietaries, white and yellow petrolatum, lanolin, few oleoresins, paraffin, cacao butter, yellow and white wax and three ointments, complete the total. Of the animal crude drugs or animal substance there are six, ovarian, mammary, thyroid, pancreatin, pituitary and pepsin. There are two powdered extracts, ergot and nux vomica, and one solid extract, ergot.

Many tablets and a few pills which are prescribed must be purchased. Those most commonly prescribed (with amounts per month and code) are aspirin compound (Apc), 10 thousand;

aspirin (As) 8 thousand; phenobarbital 1 1/2 grain (Pb); 2 thousand liver pills (Ox), known as oxgall compound; 1 thousand quinine sulphate 5-grain pills (Q) 8 thousand; C. R. C. (Cr) 1 thousand; amidopyrine (Pyr) 1 thousand; methenamine 7 1/2 grains (Hx); 2 thousand methenamine and sodium acid phosphate 5 grains each (HxPs) 8 thousand; thyro-ovarium (To), 1/4 grain thyroid, 5 grains ovarian substance 4 thousand; ovarian 5 grains (O) 1 thousand; ammonium nitrate (An) 7 1/2 grains, enteric coated 2 thousand; 2 thousand potassium permanganate (Km) 5 grains; digitalis 1 1/2 grains (Di-t) 8 thousand; morphine sulphate hypodermic 1/4 grain 15 hundred (mostly used in hospital and emergency room). A great variety of ampuls are used. The ones commonly dispensed in large amounts per month are as follows: Caffeine and sodium benzoate 7 1/2 grains 200 ampuls; 300 glucose 50%, 50 cc.; 200 pituitary extract O. B. I. cc. Of the narcotics per month: 3/4 ounce morphine sulphate, large cubes; cocaine hydrochloride powdered, 2 ounces; pantopon hydrochloride 1/2 ounce.

Of the many drugs, a few are called "Rare Drugs," as they are rarely used: Asiatic pills, chromium sulphate 4 grains coated tablets, barium chloride, bismuth oxychloride, potassium chloride, potassium sulphate, aluminium hydroxide, ethyl acetate, thallium acetate, potassium bicarbonate, ferrous chloride, phosphoric acid, galactose, quinine tannate, sodium phosphate, sodium acetate, iso-propyl alcohol, calcium bromide, oleum russi, oleum thuja, acid hypophosphorous, acid pyro-gallic, eugenol, fluidextract stramonium, calcium diphosphate, fluidextract xanthoxylum, tincture kino, fluidextract tolu, glycine, sodium sulphide, sodium formaldehyde sulphoxylate, malachite green, mercury oxycyanide and nupercain. If time permitted, it would be interesting to know how and why used, and the good and bad results of these drugs.

There are stocked 16 powders, which are made by the pharmacists. Some of the N. F. and U. S. P. have been slightly changed to meet the requirements of the hospital medical staff. There are 38 ointments, 21 tinctures and 26 fluidextracts kept in stock.

In order to speed up the dispensing the following solutions and preparations are kept in pints: (Note code.) 50% ammonium chloride (E), alcohol and boric (A*B)—50% saturated solution boric acid, alcohol and bichloride (1:1000) (A*Bi), aromatic spirit of ammonia (aSa), tincture belladonna (Be), tincture benzoin compound (Bz), iodine drops (Id), tincture opium camphorated (Pg), 75% chloral hydrate with glycerin added, tincture digitalis, fat-free (Di), ear drops (Ed), ephedrine in oil 1% (Ef-o), ephedrine drops (Ef-d), tincture hyoscyamus (Hy) tincture iodine (I), 75% iron and ammonium citrate (Fec), Lugol's solution (Lu), nose drops (Nd), 50% sodium thiocyanate, 100% potassium citrate (Kc), salicylic and alcohol (S*A), 75% sodium salicylate (S), 75% sodium citrate (Nac), syrup ferrous iodide (FeI), S. S. K. I. (Ki) saturated solution potassium iodide), 75% theobromine-sodium salicylate (Th), stomatitis swab (Is), toothache drops (Td), syrup ipecac (Ip), zinc eye drops (Zc); in quarts: alkaline cough (Ac), alkaline anti-spasmotic cough (Ac 2), astringent gargle (Ag), solution aspirin (As-s), anti asthmatic (Ast), bitter cascara (Cs-b), solution benzoate and salicylate (B*S), anti nausea (C*A), baby iron syrup (Fe), calamine liniment (Cl-l), liver compound (Nb), syrup hydriodic acid (Hi), elixir cramp bark compound (K), kaolin magma (Ko), liquid cold (L-c), elixir lactated pepsin (Lp), milk of bismuth (Bi), mix treatment (Mt), bismuth and paregoric (B*P), high blood pressure (Hb), mercurochrome 5% (M 5%), refrigerant No. 2 (Refri. No. 2), and zinc oxide lotion (Zo-l).

Besides filling prescriptions for the clinic the pharmacists have to fill daily eleven ward baskets of the hospital which have an average of 3300 items per month, many items in the form of prescriptions. The time for this work is limited to one hour, from 8:00 A.M. to 9:00 A.M. Sometimes the hospital "wants" and prescriptions are so heavy that it will be noon before one of the pharmacists can complete them. No basket is allowed out of drug room until completed, but an item or prescription may be removed by the pharmacist if in great need. There are other institutions that must be taken care of during the day with wants and prescriptions that are outside of this institution. These wants are brought in by the outside nurses or a person who has been assigned to that duty by that institution, and who picks up prescriptions then or later, depending upon the kind of case and the urgency of the drug. These institutions do not have to pay for the drugs. They are as

follows: Crittenden Home, convalescent homes (7), city jail, county and city nurses, tubercular clinic nurses, fire department, city health department, catholic clinic (although they take care of package items themselves), and health center prescriptions when patients cannot have them filled in a drug store of their neighborhood.

Between the hours of 9:00 and 10:30 A.M. the department has the rush on refills. No narcotics or barbituric derivatives are refilled, and are marked "No Refill." After three refills, patient must see the doctor again and is forced to see him, for the code on the label is scratched. No stomach, cardiac or pellagra case is scratched, as their treatment is long. The daily average on refills is about 125 prescriptions. The new prescriptions are taken in first so the labels can be written, while refills are filled in same container, patient by patient, if possible.

Three placebo prescriptions have been made with the hope of cutting down on refills. They are: Placebo Number one (tr. nux vomica, drachm 1, green coloring drops 1 aqua *q. s.* ounces 3), Sig: Drachm 1 three times a day; placebo Number 2 (oleum ricini, fluidextract asafœtida, ether, elixir ammonium valerate, *aa q. s.*, ounce 2. Sig: one drachm *t. i. d.*; Placebo Number 3; croton oil 10 drops, oleum chenopodium one drachm, red coloring oil soluble 5 drops, mineral oil *q. s.* 2 ounces, Sig: one drachm every three hours, Number 1 placebo usually comes back all three times for refill and receives a new order; Number 2 comes not over three times and Number 3 never comes back.

All refills must be out by 10:30 A.M. and not received after this hour except on extreme emergencies. Every minute counts, as there are new prescriptions to be filled at the same time, and morning clinics must move out to make room for the large afternoon clinic. All prescriptions must be counted daily and classified in eleven departments with subhead of other institutions, which is included in the grand total of prescriptions filled per day. A record is made of preparations manufactured by us. The classification of prescriptions is as follows: Number of prescriptions to clinic patients, out-patients, hospital patients, hospital employees, venereal clinic patients, narcotics, ward baskets, barbituric derivatives, City doctors' patients, emergencies, vaccines and serums (which include insulin prescriptions). A total of institutions is kept separate, but included in the grand total under out-patients.

The outside doctor deals the drug room miserly, on account of the limited stock and simplicity of drugs and preparations. These require changes, so the doctor has to be called, or may, if possible, have the hospital chief doctor change the prescription in case the outside doctor cannot be located, if the patient is willing for a change to be made. The therapeutic value is not altered. Capsules are filled by patients wherever possible, especially if it be a long treatment and a great number are required. As yet we have not found any patient unwilling to fill his own capsules. For instance, we have a number 12-size capsule for vaginal insertion, used in treatment of *trichomonas vaginalis*, which contains glucose 2, starch 1, boric acid 1 and $^1/_{10}$ grains arsenous acid, to each capsule. This powder mixture with the empty capsules and directions on label "insert at night after hot douche," is given to the patient.

There are 8 capsules as follows: (Note code and formula.) (AH) analgesic hypnotic (phenobarbital $1^1/_2$ grains, amidopyrine $3^1/_2$ grains); (Thy) hook worm caps (powdered thymol 5 grains); (Tw) tape worm (oleoresin aspidium $7^1/_2$ drops); (Mw) mixed worms (oleum chenopodium and carbon tetrachloride in mineral oil); (A. Q. D.) cold Nc caps (aspirin, quinine, Dov-

er's powder; (A. p. c) capsules or Nc capsules (aspirin, phenacetin, codeine phosphate (1/2 grain) or pantopon (1/6 grain)); (PMP) endocrine hemorrhage or organic uterine hemostatic (placenta, mammary, pituitary substances) and (Ob) obstetrical capsules (powdered extract ergot, powdered extract nux vomica, quinine). These capsules are kept filled in the dispensary. Capsules for tape worm and mixed worms are filled when ordered, as they contain liquids. All of these capsules are filled whenever time permits, otherwise at home.

On all prescriptions, wherever possible, the pharmacists dispense liquids, as this speeds up the work. For instance, the so-called themoninal tablet is ordered, liquid is dispensed, which has nearly the same therapeutical value; (a 4-ounce solution of theobromine—sodium salicylate 7 1/2 grains and phenobarbital 1/4 grain to the drachm.) All changes have been pre-arranged with all the doctors on the staff and as many of them are uptown doctors, who are in the habit of writing for proprietary pharmaceuticals, which of course does not conform with the hospital formula.

Salesmen or detail men are allowed to see the pharmacist between 9:30 and 11:30 A.M., but outside of the drug room.

The charging for drugs or certain prescriptions is not new. In 1919, there was a charge for morphine sulphate to addicts at 10 cents a grain, with the idea of eliminating or decreasing drug sales of this sort on the streets. The results were of no avail; although 122 addicts were removed from the streets, who were served with their daily amount of morphine in solution for hypodermic use. There was another side to this kind of treatment, in that the dosage was reduced by 1/8 grain daily, without the knowledge of the addict, until only water was issued. Only two patients got down to water. One died and the other received an extra supply through the street trade. This clinic only lasted a few months, as it had to be closed on account of bad results. Some of the patients got as high as 20 grains per day; none under 1 grain. This was extra work, for there was only one pharmacist at that time. All the vials had to be sterilized, and filled daily. Only one hour in the morning and one in the evening was allowed for these poor addicts, and a receipt had to be issued to each patient and a check kept on them, as they had to report daily. The closing of the narcotic clinic was one of the happiest days in the life of the author, as there was plenty of grief attached and extra hours without compensation.

It is hoped that the small charge made for drugs will enable the hospital to decrease the clinic patients who are habitual ambulatory cases. Besides prescription charges, there is one on vaccines and serums; $1.00 for tetanus antitoxin, 1500 units; $1.50 on ten thousand, diphtheria anti-toxin; $3.00 on twenty thousand units. Of course, if the patient cannot pay, no charge is made. Insulin is 60 cents for a 10-cc. vial U40. All hypodermics which are administered in emergency room are graded the same as prescriptions, from 0 to 25 cents. Hospital patients get everything free.

Now a little comment on the book of formulas as used in Jefferson Davis Hospital. In order to curtail the stock the hospital compiled formulas to meet all demands. Two hundred and fifty-one formulas were placed in the form of prescriptions with a number and a code above each. Since then it has been necessary for more formulas to be added; and the book is now in its revision. The book has a cross index and is almost a little library in itself, with baby feeding and an index of diseases with remedies. The remedies are in the form of prescriptions which are numbered for quick reference. The code is of interest, in that it has some relation to the drugs or their action and that is why we prefer code if the prescription is not written. Numbers are deceiving, especially the way some of the doctors write them, and, too, he may memorize the number and get the wrong one, whereas with the code the doctor can't go wrong. For instance, the doctor wants a pain killer as aspirin compound. The code would be APC (aspirin, phenacetin, caffeine), or say Liquid ache (L-a), (antipyrine, sodium bromide, caffeine in elixir lactated pepsin). The first prescription is number (7) and the second is number (8). Suppose

the top of the 7 was not clear, then it would look like prescription number (1); or the bottom right half part of the 8 was not clear, then it would look like prescription number (9). In number (8) the doctor wanted a liquid, but got tablets; in number (7) the doctor wanted a tablet, but received a powder. In the foreword of the book is printed the following:

"This book of Formulas is prepared for our doctors, giving them an idea of the kind of stock that our budget will allow us to carry in the drug room, thereby making it convenient for them to write prescriptions. In the back of the book are blank pages for new prescriptions. Please consult the pharmacist so that he can plan with you about the stock.

"In writing prescriptions, if the doctor so desires, he may use the code or number of the prescription as found above each formula. Code or number will enable the pharmacists to work at a greater speed and get the patient back home at an earlier hour. The doctors are invited to write prescriptions in standard amounts as much as possible, so that the drugs may be prepared in advance."

Some of the preparations require special treatment. For instance, the eye solutions. They are strained through several folds of gauze bandage and cotton to remove any mechanical trash or foreign body.

Solutions are made with 2% boric acid and glacial acetic acid added, one drop to the ounce. This acidifying of eye solutions helps to keep them clear and colorless, especially eserine preparations. If a preparation of liquid type has to be kept for any length of time or has to be sterilized, chloretone is added, one drop to the ounce of a saturated solution in alcohol. Alcohol is employed freely to clear up solutions wherever possible. Glycerin is used instead of sugar or syrup, especially if a preparation has the tendency to be "rough" or "raw." It seems to give it a smoothness that would otherwise be objectionable. Castor oil is used to start off ointments and the finished product is like velvet.

The labels for the hospital have one or more names and in cases of percentage solutions or other preparations, the figure is used with the per cent sign and beneath this in parenthesis the number or strength is written out. This usually removes the doubt. For instance, a 10% solution could be taken for a 1% solution if the O was faint or entirely gone, but the word beneath it as (ten) or (one) makes the label clear.

A combination of flavors and colors is employed wherever possible, in making liquid preparations. Sometimes two flavors are blended or two colors making a different shade. Then again an orange flavor may be red instead of orange or made dark lavender.

In the delineation of these multitudinous services rendered by the drug room or dispensary, you have probably gained the impression that quite a large staff is required; strange as it may seem, two pharmacists and one helper constitute the entire drug room personnel. One is a graduate pharmacist, one a registered pharmacist and the call clerk is the only other helper.

The problem of insect quarantine will be studied by coöperation of Pan-American Airways, the United States Department of Agriculture, the Hawaiian Board of Agriculture and Forestry and the Hawaiian Planters' Association. Officers of the territorial plant quarantine service are required now to inspect rigidly every transpacific plane reaching Honolulu.

A new museum building, for which plans have been completed, will be erected this spring at Sul Ross State Teachers College, Alpine, Texas. It will be known as the Big Bend Historical Memorial and will house the West Texas Historical and Scientific Society which now has headquarters and collections in the administration building of the college.

THE CALIFORNIA INDIANS: THEIR MEDICAL PRACTICES AND THEIR DRUGS.*

BY JOHN CULLEY.

The California Indians are perhaps the least known of the aborigines of North America. They and those of the entire Western and Pacific slope are racially different in many ways, in their general characteristics, habits and modes of living from those of the Atlantic Coast and the Great Plains.

The California Indians can be traced to three distinct geographical migrations which account for the wide variance in their culture. Those of Northern California entered the state from the North Pacific coast and brought with them the beliefs, habits, practices, traditions and culture of the northwest. The Indians of Central California came from the western plains of the Rocky Mountains. The Shoshones and the Piutes' ancestors have been traced to the Aztecs of Mexico. The Indians of Southern California migrated into the state from Northern Mexico, Arizona, New Mexico along the Colorado River Basin.

There are about forty-five Nations or Tribes of Indians in California representing twenty-one entirely distinct linguistic families, or one-fourth of the total number for North America. California is regarded by anthropologists as the region of the greatest linguistic diversity in the world.

The climate of California and of the entire Pacific Coast is very mild, in some parts tropical and sub-tropical. The land is very fertile and all kinds of food and game grow in abundance. Conditions were generally conducive to easy living. The Pacific Coast Indians show the effect of living in such a climate. They were non-nomadic and inclined to remain in their respective districts. Food was easy to obtain so they were not cultivators of the soil, nor were they big game hunters, their hunting being confined to the smaller game and fishing.

The Indians of California and those of the West do not have the highly aquiline nose and coppery complexion of the Eastern Indians. In stature, they are shorter, inclined to stoutness, and short headed. They do not dress their persons with gaudy colored and gorgeous ornaments.

Their complexions are darker and when they did paint their bodies it was with dark colors. They were not war-like; in fact, they were the least war-like of all the American Indians. They had their various tribal wars, usually not wars of conquest, but wars to protect their own districts from invasion. They did not use tomahawks, neither did they scalp their enemies or burn them at the stake.

California Indians, not being nomadically inclined, regarded themselves as originating at the place in which they lived. The word "Pomo" occurs in various forms in many of their languages and signifies "Earth people" and refers to their belief that their first ancestors were created directly from the soil of their respective dwelling places.

The general intelligence of the California Indians is of a very low order, perhaps the lowest of all Indians of North America. Culturally they are no doubt the simplest and crudest of all American Indians. The climatic conditions and easy living were seemingly not conducive to much original thought.

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* Section on Historical Pharmacy, Portland meeting, 1935.

GENERAL MEDICAL THEORY OF THE CALIFORNIA INDIANS.

Medicine is said to be the art of restoring and preserving health. It is the agent or influence used to prevent, alleviate, influence or cure disease or its symptoms. The American Indians, including those of California, used a wide and very extensive scope of agents in their endeavor to produce such results.

Of the questions that all mankind, civilized and uncivilized, propound to themselves and to High Heaven, there can be in our present state of intelligence no answer to the most important, except answers supplied by religion and faith.

The California Indians were intensively religious and had a very pronounced faith in their practices of healing the sick. The practice of magic combined with some form of hypnotic appeal was their chief instrument in the art of healing. The use of drugs was mostly incidental.

The fundamental law of magic has been stated to be: "Whatever mankind naturally imagines to be, will be." When a person is deeply in earnest and believes that a thing can be done, it very often is done. Many wild and uncivilized people when ill and willingly disposed have a certain faith that they are going to be cured, yield readily to some form of suggestion and they are cured. That practice is not confined to the uncivilized. The California Indians used faith, prayer, magic, suggestion, hypnotism and psychology, symbolic and empiric means, songs, incantations, fetishes, rituals and superstition combined with various mechanical devices and the use of a few drugs to effect a cure for disease.

Dr. Agard of Oakland, California, in speaking of the White Races says:

"Man, an animal which takes pills for what ails him, and is never cured."

It applied equally well to the California Indians. The Indians merely change their methods of drug consumption. The term "Medicine" to the Indians covers a great deal more ground than it does to the educated white man; to the Indians of California and to all Indians it means anything under the sun, manner or agency, either supernatural or temporal, magical or therapeutical, symbolical or physical that could be invoked as an aid not only in curing disease, but to insure success of tribal undertakings or the success of individuals in overcoming obstacles. Any ritual, ceremony, article from persons or animals, roots and herbs that could be invoked or imbued with a supernatural or mystical quality to eradicate bad influences, moral or physical, were referred to as being "Good Medicine." Generally speaking, all evil or bad influences either supernatural or material were referred to as being "Bad Medicine."

The theory of disease among the California Indians was that all diseases reside in the blood and the proof of this belief is that blood collects under a bruise and that the blood coagulates. All illness not connected with a visible wound or caused by an accident was considered as an entrance into the body of an evil spirit, or even something more tangible. To get rid of these invasions was the intent and practice of the various rites and ceremonies accompanied with the use of drugs and medicines.

The American Indian was content in the belief that he was placed upon this earth to conquer his enemies, have good hunting and plenty of food and eventually pass on to the Happy Hunting Grounds where he could continue to hunt buffaloes and wild game to his heart's content. The Happy Hunting Grounds under

the jurisdiction of the Great Father had a somewhat different meaning to the California Indians. It was a place where they could continue on with the same manner of living with all earthy troubles eliminated, no hard work, no wild hunting but an eternal existence of ease and contentment.

DISEASES OF THE INDIANS.

The written history of California and of the West Coast began about 1770 with the advent of the Spanish and Mexican missionaries and they made very few records of the Indians and their life, being more interested in their religious conquests rather than in the history and habits of the Indians.

Many of the California Indian tribes were not known until the discovery of gold about 1848. Hence, there is little evidence to show what diseases were prevalent among the Indians previous to the advent of the white men, and what evidence we have shows that the California Indians were subject to various diseases and were not racially immune to any type. Many diseases common to the white race were unknown to the California Indians, and actual knowledge regarding the causes, nature and rational treatment of diseases was not known at all. The culture and medical practice of the California Indians remained in a rudimentary stage. In no way did their medical practice compare with the Indians of neighboring states, especially those of the south.

Smallpox, tuberculosis, cholera, typhoid, scarlet fever, measles, whooping-cough were not known to exist. Syphilis and gonorrhœa were introduced by the white men and are not considered Indian diseases. Some Indians actually sought these diseases so that they could revenge themselves on their enemies. They also thought that by passing it on to others they got rid of their own trouble. Cancer, neoplasms and malignant growths are not Indian diseases and no evidence is known of their existence among California Indians. There was but little insanity, idiocy, cretinism, paresis and liver, heart and kidney troubles were very rare.

The most common type of diseases were gastritis due to periods of starvation, irregularity of eating, over-indulgence during periods of plenty, and the consumption of raw and unclean food. Dysentery prevailed in the summer. Eye diseases were frequent due to living in unventilated tepees filled with wood smoke. Coughs, colds and pneumonia were common owing to the outdoor life and exposure to all kinds of weather. Rheumatism and neuralgia were a source of great trouble. Malaria and fevers were prevalent as the Indians lived close to water courses. However, they seemed to sense that dampness was the cause of this complaint and in wet seasons they moved up to the hills and around the valleys which served as a sort of sanitary measure. Naturally, their outdoor life was a source of many fractures, cuts, wounds, sores and they suffered a great deal from the bites of insects and snakes. Itch and vermin caused great suffering.

MEDICINE MEN OF THE INDIANS.

The medical practitioner of the Indians of California and of Northern America was generally alluded to as Shaman, the medicine man of the tribe. He was very powerful in his influence for good or for evil and his powers were exercised over a wide sphere of action. He was supposed to have some supernatural or occult power that was passed into him by the Gods. He was the possessor of some sacred formula that helped him accomplish his various deeds. He healed the sick and ailing by invoking these powers. He had the ability to perform certain types of magic which we now know to have been ordinary sleight-of-hand tricks. He could subject others to his will by a type of hypnotism. He was supposed to have the power of enlisting the Gods to his aid to bring forth rain, prosperity and a plentiful supply of food.

While each and every medicine man had his own specially developed method of performing his various rites, and no two worked alike, yet there is a certain sameness in all of the methods of the Shamans. Curative medicine or medical practice usually combined all of the various powers of the Shamans and reliance for the cure was based more upon the mental effect of the ceremonies rather than upon the therapeutical effect of the drugs used.

The Shamans were shrewd, accomplished and experienced in their arts; they had the full confidence of their people and were unusually well paid for their services. Next in importance to the supernatural and ritualistic methods of healing the sick was the general use of sweating. It was universally used by all tribal Shaman as an adjunct to other methods in almost all types of diseases, especially so in elimination of painful complaints such as rheumatism and neuralgia. The use of this sudorific method of treatment was one of the most important principles of the Shaman's medical practice. Its use embodied the same principle in all cases. The methods only changed with each tribe. The patient was placed in lodges, tepees, earth mounds, pits or trenches, and sweating was induced by the heat produced from the dense steam emanating from heated stones drenched with water or covered with wet earth or wet grasses.

SURGERY OF THE CALIFORNIA INDIANS.

Surgery, as modern practitioners understand it, was not practiced by the California Indians, yet they were rather expert in many ways in this branch of healing.

Broken bones were skilfully set with splints of wood or in some instances with strips of fresh hide which when dried would harden into a cast comparable with the plaster of Paris bandage. Cutting out abscesses, blood letting by cutting for local inflammations, cuts between the eyes for headache, blistering by sucking the skin and the blisters opened for the relief of rheumatism, cauterizing with hot ashes to control bleeding, bandaging fresh cuts and wounds were but a few of the various surgical operations that the Indians seem to be quite capable of handling. Dentistry was confined to teeth pulling with punch or mallet or by prying. A favorite method of treatment by the medicine men consisted of sucking the affected part until the blood flowed, by which means they pretended to extract the cause of disease.

Childbirth was particularly well understood and their practices in that line were much better than the average of their contemporary whites, although some of their methods while successful, were rather crude and bizarre. No doubt the success in this line was greatly due to the smallness of the Indian baby and the general good health and habits of the Indian woman.

Many diseases and abnormal defects of the system were treated with a sort of massage or rubbing the parts affected. They knew nothing of bacterial diseases and the causes of diseases. Antiseptic treatment was unknown and yet the Indians were remarkably immune from infection in open and fresh wounds. They recovered from such hurts much faster than did the whites and from wounds that would have proved fatal to the white men. Perhaps they may have some racial immunity from such septic conditions but a more reasonable explanation is on account of the cleanly manner used by the Indians in washing and treating open wounds.

Anesthetics, either general or local, were unknown as such although some medicine men employed a decoction of Datura both on their patients and themselves, which produced a narcotic frenzy and which may have acted as a general anesthetic, but not so designed.

History shows that the California Indians were not subject to many contagious diseases until they were introduced by white men, so quarantining was not a part of their original medical procedure.

Smallpox was the most terrible and fatal of the diseases introduced to the Indians by the advent of the white men. It was foreign to their nature and so very fatal that it completely terrorized them. They developed several methods of their own to combat the spreading of this disease. When a family of the Piute Tribe became afflicted the entire family, together with all of their belongings quietly disappeared forever. It seemed to be a very effective way of combating the spread of this disease. Other tribes burned all of the belongings of the patient, including the huts or tepees, clothing and personal effects, and buried the body. Other tribes spread the belongings of the afflicted one out to the air in the sunlight for several days as a method of disinfection. Other tribes flew a flag at the top of the tepee to warn others to keep away.

California Indians usually cremated their dead. Only bad Indians, those who came in contact with the white men and inherited some of their bad traits and diseases, were buried. It was a grave indignity and an insult to the tribe to "hole" any of its dead.

THERAPEUTICAL PRACTICE OF THE CALIFORNIA INDIANS.

The drugs used by the California Indians consisted of roots, barks, leaves, herbs, a very few fruits and blossoms and but few animal and mineral substances.

The women of the tribe were allowed to use and prescribe only those drugs easily accessible and the very common types of plants. Those drugs that were difficult to obtain; those that grew in the mountains, in out of the way places were deemed more valuable and therefore only tribal medicine men were allowed to handle that type of drug.

Hollowed out stones were used as mortars to pound the drugs and food to a powder or to a paste. Mortars and pestles variously decorated were used by some tribes, however, they were prehistoric and not made by the Indians themselves. They, were no doubt, brought into California by the Spanish and Mexican missionaries.

The drugs used by the Indians can naturally be classed into three divisions according to the methods of use in their tribal practices.

1. Those drugs and methods that were absolutely noneffective, having no action on the body and used only in a superstitious manner and for supernatural effect.
2. Those drugs that resemble a part of the body or the disease and supposed to cure because of that resemblance.
3. Those drugs that actually produced a therapeutical effect.

Class 1.—Drugs and methods used for superstitious effect. The father of a Mohave Indian refrained from drinking tea to cure his children of whooping-cough. Ashes of various plants and effigies were scattered over the patient accompanied with incantations and appropriate music to drive away the disease. The Tatu Indians used a method of tying down the patient with bent branches of small trees, believing that the tension will actually pull out the disease. The Tatu Shaman used dried rabbit bladders filled with stones and beat himself and the patient with them, accompanied with the proper chants, music and motions. The Yokaia Indians placed great confidence in a stuffed lizard used as a charm or panacea to ward off many diseases.

Angelica Root was attributed with great talismanic properties by the Hupas and other tribes. Tobacco smoke was blown over the patient to drive out the evil spirit of disease. An infusion of Datura was used to produce exhilaration and religious frenzy in some of their ritualistic methods. Wild parsnip was believed to be a deadly poison and would cause nose bleed of those carrying it, and those keeping it in their homes would surely die.

There is no record of any California Indians using poison to take human life, for murder or to kill off their enemies. The poisonous effects of drugs were well known, but the drugs were never used for that purpose. Bunch Grass in the form of small bows and arrows were shot against a pregnant woman to cause miscarriage, or to hasten maturity of a young maiden.

Central California Indian men practiced a very unique custom, which is also used in other parts of the world. The father of a prospective child remained at home for two weeks and abstained from various luxuries such as meat, fish, tobacco, hunting, gambling and work. Sometimes he went to bed and grunted and groaned and implied that he suffered all of the agonies of childbirth.

It was the custom in many tribes for the Shamans to lecture to the young people entering upon manhood and womanhood, on the subjects of morals and the physiology of those entering upon this period of life. They lectured upon the wisdom of right living according to their standards, prosperity, long life and agility. They frequently gave doses of Datura at this time to create a receptive mood from the narcotic or hypnotic effect upon the young people.

Class 2.—Those drugs used because of the resemblance to the disease or to a part of the body. Hot ashes of burned plants or hot coals were placed on the inflamed part. The so-called Moxie Cure, the application of hot mud packs to relieve inflamation. A species of Clematis, resembling hair, was used as a hair tonic. A twisted piece of wood was placed on a person suffering from convulsions. A splint made from the wood of a tree struck by lightning was used on a broken limb. Parts of the same rattlesnake were applied to the bitten portion of the body. A stem resembling a worm was used as a vermifuge. The Yokuts of Central California used scrapings from bear claws as an infusion to bring about childbirth. Some tribes produced counter-irritation to cure stomachache by allowing ants to roam over the abdomen.

Class 3.—Drugs used for their therapeutical effect. Drugs were usually prepared into a decoction or infusion and consisted generally of but one drug and given in one large dose, preferably in the morning. The dose was seldom repeated and if satisfactory results were not obtained the Indians then resorted to the ritualistic method of cure.

Datura, a species of Jimson Weed, known by the south California Indians as Toloache, was perhaps the most universally used drug by the Indians. It was employed for nearly all diseases, therapeutically and ritually. The pounded root was used as an application for cuts, wounds and bruises. A decoction of the blossoms and root was given to produce a narcotic effect. It was employed for paralysis and general debility. Medicine men used it themselves to produce a narcotic and religious frenzy. It was given to the patient during the setting of broken bones, for its anesthetic effect. It was taken in large doses as an aphrodisiac and known to be effective. An infusion was used to give luck to the gambling Indian. In case of an overdose an emetic of hot water was given. If the patient passed on to the Happy Hunting Grounds after an overdose, it was an indication that his bowels were in a very poor condition.

Acorns of various species of Quercus were used both for food and medicine. The acorn was dried, ground and beaten to a flour. Prepared as a food it was macerated several hours with water to remove the bitter principle.

Silver Pine (*Pinus edulis*)—the Pine nuts were used for food. The nuts were crushed and beaten raw and used as a plaster for burns and scalds.

Pitch of the Silver Pine, the natural oleoresin, was employed internally for coughs and colds; externally as an application for rheumatism. It was applied as a plaster to sores and wounds and renewed as it wore away. The soot from burning pitch was used in tatooing. *Pine Cone Core* mixed with Bunch Grass was boiled into a strong decoction and used as a black hair dye. The Indians were very proud of their black hair. *Tar from the Pitch of the Silver Pine* was mixed with burnt acorns and used by widows as a mourning skin powder or cosmetic.

Mistletoe, growing on the Silver Pine, was administered as a remedy for colds, coughs and rheumatism. One of the methods of use was by inhalation of the smoke from the burning drug.

Soap Root (*Chlorogalum pomeridianum*) had many uses. A decoction of it was used to remove the mourning paint or powder of the widow. It was used to kill fish in the manner that other Indians used Cocculus Indicus. As a medicine it was used to expel gas from the stomach caused by overeating. The powdered root was applied hot to old sores. It was used as a purge in constipation. During scarcity of food, it was mixed with a species Buckeye, roasted underground for thirty-six hours to remove poison and then used as a food.

Willow was little used as a medicine, but made into arrows for supernatural effects.

Poison Oak—California Indians seemed to be less affected by this drug than were the whites. Early in life the young Indians were fed small doses of this drug which evidently produced immunization against its effects. It was also given in the form of an infusion to cure the effects of Poison Oak.

Buckthorn, Frangula Californica, was ground, heated and placed hot in the mouth against an aching tooth.

Peppermint and *Spearmint* were used for coughs and colds.

Mullein, a species of small mullein, was used for fever and ague.

Lichens, of a greenish gray type (*Parmelia Saxicula*), was used as a cure for colic.

A Paracitic Vine, a species of Gallium, was heated or burned and placed hot over rheumatic pains.

Yellow Dock (*Rumex crispus*) was employed as a dry hot plaster applied over any painful part.

Wild Parsnips were applied to induce nose bleeding.

Mushrooms—two varieties were used for food.

Angelica was used as a cough remedy, and in ritualistic procedures.

Yerba Santa leaves were used to a limited extent for stomach troubles.

Cascara Sagrada and other species of Rhamnus were employed by the Indians of Northern California as a general tonic and cathartic. They were familiar with the poisonous qualities of the fresh bark.

Quaking Aspen Bark (*Populus tremuloides*) was used by the Mohave Indians of Southern California as a febrifuge.

Senega Root (*Polygala Senega*) was administered in infusion form for dysentery and diarrhœa, which were very prevalent among all tribes of Indians.

Euphorbia was applied for rattlesnake bite.

Croton Californica was used for abortion. This was not a general practice and only after the Indian women came in contact with white men.

Nut Gall in decoction form was applied for sore eyes, fresh wounds and other sores.

Solanum Douglasii—the juice of the seeds was used as an application for sore eyes.

Peyote, Mescal, was introduced by the Mexican Indians to the south California Indians.

Pennyroyal and *Sage* were used as febrifuges and diuretics.

Grindelia Robusta was given for bronchial troubles.

Berberis Aquafolium was used as a tonic.

Sassafras, as a decoction, was valued for respiratory affections from which the Indians suffered greatly.

Balm of Gilead buds were applied for rheumatism.

Shepherd's Purse was introduced by the Mexican Indians to the Southern Indians. A non-alcoholic beverage was made of it. Intoxication from alcoholic beverages was unknown by California Indians until introduced by the white men.

Tobacco—a species of wild growing tobacco, *Nicotiana*, sometimes mixed with Manzanita leaves was smoked for pleasure, for ritualistic purposes and for inhalation in nasal troubles. It was used as a wet plaster for cuts and fresh wounds. Swallowed to produce sleep. A decoction was used as an emetic. The smoke was blown over an affected part as a cure.

Sambucus flowers were used as a female remedy.

Wild Clover Blossoms were eaten as food. Its use produced an excess of gas in the stomach which was then relieved with a dose of Soap Root.

Alum in the form of a crude native salt leached or shaken from the roots of several plants served as a condiment.

Wild Lettuce (*Claytonia perfoliata*) was used by the Northern Indians like a modern-day salad. The fresh plant was gathered in large quantities and placed beside a red ant hill and the ants allowed to circulate in and over the lettuce for some time and then shaken off. Thereby a sour taste was imparted to the plant; it was eaten with a relish.

Only few animal drugs were used:

Red Ants were boiled to a thick syrupy consistency and taken for bowel complaints.

Lice taken from animals were given in infusion form for chronic diseases.

Horned Toads and other varieties were used as medicine for stomach troubles.

Ring Snakes, dried and powdered, were employed by the Central California Indians for various internal troubles.

Whale Bone, found along the shores of the North Pacific, was dried, powdered and used as a specific for dyspepsia.

CONCLUSIONS.

1. California Indians practiced sleight-of-hand, magic psychology, hypnotism.
2. They knew but very little of physiology and anatomy.
3. They practiced surgery to a limited extent.
4. They knew how to set broken bones.
5. They knew nothing of dentistry, other than extraction of teeth.

6. They used blood letting to relieve swellings and pain.

7. They were familiar with the pharmaceutical processes of percolation or leaching, extraction, torrefaction, destructive distillation, decoctions and infusions.

8. They practiced immunization and later quarantine.

9. They knew as much about the therapeutical effect of the drugs used by them as did their contemporary white men.

10. The California Indians evidently did not contribute anything of value to modern surgical, dental, medical and pharmaceutical practice, nor did they introduce anything of very great value to modern materia medica.

11. The history of California Indians is therefore more of a subject of interest than of any material value.

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THE WORK OF THE RED CROSS.

The disastrous floods which recently swept through broad paths in fourteen or more states are probably the worst in the history of this country as far as property loss is concerned. As every one expected, the Red Cross organized immediately for relief work. The after-effects of the flood, as every one knows, are extremely dangerous, because of sickness and disease. Slime covers the wide area from which the waters have receded and provides breeding places for carriers of disease.

The Red Cross, before the coming of the flood, was about ready to institute its chain of first-aid emergency stations along important highways. These are to be established in wayside stores, gasoline service stations, tourists' camps. Standard kits of first-aid supplies are to be placed in the hands of persons who have been given a general course in first-aid treatment. The treatment before the arrival of the doctor will be purely emergency in character and, doubtless, those who have the matter in charge realize the danger of assigning such responsibilities.

The subject of First-Aid was discussed by Pittsburgh Branch, A. PH. A., several years ago (see April JOURNAL for 1931, page 397), and it may be well for all Branches to invite physicians and Red Cross workers to join in a program for such study and discussion. The aftermath of the flood emphasizes the importance of public health matters.

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C. B. JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A. A. C. P., EDITOR OF THIS DEPARTMENT.

The following paper by Dean Robert C. Wilson, President of the American Association of Colleges of Pharmacy, offers a challenge to the Faculty of every college of pharmacy in the United States. Have we, in our desire to stress professional training and turn out more graduates, been derelict in our duty to the state, the nation and our profession by giving too little attention to the question of the character of those we graduate?

I believe that Dean Wilson is correct when he says, "We have not been *too* careful as to the technical and scientific qualifications of those men and women, and we have been tragically careless as to their qualifications of character. . . ." With the longer curriculum we now have more time to give to character-building courses and to the study of the personality of our students. Every member of the instructional force should consider it his duty to become well acquainted with every one of his students, to study their reactions and to impress upon them the importance of those qualifications that go to make up good character. If the student fails to respond, is indifferent or opposed to the ideals of pharmacy and good citizenship, this should be an excellent reason for refusing to graduate him, regardless of how well he is technically prepared.

Until the Code of Pharmaceutical Ethics becomes a *living force* in the business and professional conduct of our pharmacists and in the training of the young men and young women who enter pharmacy, the unsatisfactory conditions pointed out by Dean Wilson will continue to exist.—C. B. JORDAN, *Editor*.

WHAT STEPS, IF ANY, CAN BE TAKEN BY THE BOARDS AND COLLEGES TO GUARANTEE TO THE PROFESSION AND TO THE PUBLIC THAT ONLY THOSE OF SUCH ETHICAL AND MORAL CHARACTER AS WILL REFLECT CREDIT UPON THE PROFESSION OF PHARMACY WILL BE ADMITTED TO ITS RANKS?*

ROBERT C. WILSON.[1]

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As a tragic evidence of what is happening to Pharmacy in the mind of the public, our Pharmacy Building, THE AMERICAN INSTITUTE OF PHARMACY, was recently referred to by a distinguished writer and a man of wide influence throughout America as "The Tomb of the Unknown Pharmacist." This prompted the title of this paper, which is the query submitted to the various District Boards and College groups. Get the full significance of this observation which was not intended as a slur on Pharmacy, but which may so easily be construed as such, *A Tomb*, denoting death—*The Unknown Pharmacist*, denoting the fact that the building represents some *one* or some *thing* of which we may have heard, but of which there is no living example. This should shock us into the realization that if, while there is yet time, we would salvage anything of value from the wreck we have allowed the public to believe has come to us, our program for the future must be so shaped that THE AMERICAN INSTITUTE OF PHARMACY, rather than a *Tomb*, will become in the minds of the public a *Flaming Torch*, and an inspiration to *us* to place Pharmacy in the front ranks of all professional, ethical and scientific activities.

* District No. 4, Boards and Colleges, La Fayette, Indiana, March 27, 1936; also District No. 2, Boards and Colleges, Atlantic City, March 9, 1936.

[1] President of the American Association of Colleges of Pharmacy.

In any movement which is directed toward the improvement of conditions in an institution we must consider the historical background, what the present trends and practices are, and how its future must be shaped so as to bring into fulfilment the ideals and ambitions we hold for it. It is axiomatic that these ideals and ambitions be of the noblest order.

When the true history of Pharmacy has been written from the standpoint of the cold facts revealed therein, I believe that it will reveal, among other important things, the fact that the foundations upon which it was built rest upon bed-rock, are capable of carrying a structure of the noblest proportions and this structure should be consecrated to an effort of real scientific achievement and an active spirit of service.

As typified by the condition we find in Pharmacy to-day, which is an omen of what it may be in the future, can we be proud of the structure we have erected? As judged by other professional groups and by an observing public, the structure we have erected perhaps reflects an image far removed from the character of edifice such a foundation promised.

There must be ways and means by which the present structure may be razed and a new structure reared, commensurate with the dignity and solidarity of the original foundation. This becomes your responsibility and mine, if, profiting by the mistakes and the false gods of the past, we are to have a structure of which we and those who are to follow, may have just cause to be proud.

It is a well-known historical fact, which is repeating itself from day to day, that any worth-while institution is built around the personality, the character and the ideals of some one individual or group of individuals. Our drug stores throughout America are manned by individuals. Each store is a separate unit, and has identified with it some one individual around whose personality and character and ideals the reputation of the business depends. This individual, therefore, by his conduct and by the type of institution he directs, will inevitably determine, in the minds of those with whom he is identified, what Pharmacy is and what it stands for, not only in that community, but throughout America.

In this advanced age, distance and sections are eliminated. It is a tragic fact that a one-man drug store in Georgia, in Maine, in Washington or in California, by its conduct, involving errors of omission or of commission, may discredit the entire profession of Pharmacy throughout America and for an unlimited period of time.

Many factors have contributed to the condition in which Pharmacy finds itself to-day, *chief among which can be very definitely proved to be our failure to more properly and carefully select those who have been allowed to enter the practice of Pharmacy.* We have not been *too careful* as to the technical and scientific qualifications of those men and women, and *we have been tragically careless* as to their qualifications of character and have therein failed in our primary responsibility to the institution to which we have committed our lives, our hopes and our dreams. In this neglect we become individually and collectively guilty.

It is a human trait on the part of each of us to watch and judge our fellows, and that is equally true of institutions. Each of us, therefore, must recognize that the institution of which we are a part is being judged by what may be revealed by our individual and group conduct. As painful as the realization may be, the responsibility is ever upon us and no one but a coward would attempt to evade it.

There are approximately sixty thousand drug stores in America. Through these stores, in the course of time, the entire population of America filters, coming into contact, and rather intimate contact, with some Pharmacist. By reason of this contact, these pharmacists have an opportunity to exert an influence of the highest order with the people of the Nation, and naturally the people through contact with these men, have the opportunity to judge the character and the ideals of pharmacy.

We have just passed through an era in which mass production has been the controlling fetish. Schools of Pharmacy and Boards of Pharmacy have not been immune since it was a recognized principle that numbers count, and that volume must be produced, regardless of quality.

We find ourselves at the present time in the midst of a reverse order of things, and it is an opportune time for pharmacy to begin a general process of reconstruction, based upon the principle of quality rather than quantity. This becomes the responsibility of the Boards and Colleges of America.

The passage of prerequisite legislation in most of the states is not the solution to our problem—it is but a step. The solution must come at the hands of individuals composing our Boards and Colleges, and they, if they see their responsibility clearly, must be guided by a spirit of consecration. Individual pharmacists and pharmaceutical groups must accept the responsibility of demanding that only those of proper character be chosen to fill positions on our Boards and in our college faculties.

Reference has frequently been made to the possibility that pharmaceutical education is in a chaotic state. As I contact educators in different lines of work, and come to know more of educational practices throughout America, I am not so sure but that our entire educational program may be in a chaotic state. The factors which we have omitted in our educational program, be it pharmaceutical or otherwise, constitute the most important cause of failure of any educational program. Chief among these failures on the part of general educational programs, as well as specialized educational programs, such as pharmacy and other professional fields, is the important fact that we have not stressed to the proper extent the items of personality and general character of those to whom we have granted degrees. Educational institutions should, above all things, be concerned with the development of proper ideals of citizenship in their students and graduates. Pharmacists above all others should be good citizens, because of the fact that they have such a wide opportunity for influence with the people of America. Regardless of how much technical education we may give our pharmacists, if we cannot guarantee to the public that, in addition to these qualities, they also possess the qualifications of good citizenship which carries with it the responsibility of influencing others in all of those matters pertaining to good citizenship, we have failed in our primary responsibility.

Our schools and colleges of pharmacy should be in the hands of only those who themselves have the proper qualities of character, and who know the qualifications a man should have who is to assume the responsibilities of a pharmacist. They should, disregarding entirely the matter of enrolment in their institutions, select only those of their students who have, by their conduct, by their personality and by their ability to absorb the technical training, proved their fitness to enter the

profession of pharmacy and to represent it to the public in its highest professional sense.

A school or college of pharmacy should have such an intimate acquaintance with the general character and fitness of its students that graduation would constitute a recommendation to the people of the state that this graduate is worthy of their confidence and respect, and to the retail proprietors, that the graduate is of such character that the faculty members themselves would not hesitate to employ this man, and trust him with all of the responsibilities of a business.

The Boards of Pharmacy should assure themselves and the public that the technical training is of the proper scope and character; and further, that applicants for license must produce proper evidence of integrity, sobriety, faithfulness to professional ethics and a sense of responsibility to properly influence the public with whom they come into contact.

The personnel of our Boards of Pharmacy must be more carefully chosen. Too often in the past, men have been chosen for these important positions on the basis of personal popularity, or for political expediency or because of the insistence of some self-seeker. In the future, if we would safeguard the good name of pharmacy, we must choose Board members on the basis of their personal character and technical and educational attainments, and who, having the proper ideals themselves, can more intelligently pass upon the qualifications of those who are to be permitted to enter the practice of pharmacy.

In the choice of our leaders, in our local, state and national pharmaceutical organizations, we should and must eliminate those who, for selfish purposes, seek positions of leadership, and commandeer those who, by their character, training and ideals are fully qualified to represent pharmacy in America.

When and if we may be able to bring into fulfilment such standards as these for those who will represent pharmacy in the future, pharmacy will have assured for itself the highest place in the minds of the American public and other professional groups. We will have then created a structure commensurate with the high purpose of the original founders of the Associations of the Boards and the Colleges of Pharmacy, whose responsibility is that of selecting and training those who are to represent pharmacy in the future. Those selected must be of such ethical and professional character that THE AMERICAN INSTITUTE OF PHARMACY, which represents us to the public, may not again be referred to as *The Tomb of the Unknown Pharmacist.*

A. PH. A. STUDENT BRANCHES.

See Council Letters for organization of A. PH. A. Student Branches. Kentucky and Mississippi Student Branches have been organized. Dean G. L. Curry is the faculty adviser of the former and Dean E. L. Hammond of the latter. There are great opportunities in these organizations, not the least a closer relation of the members of the student body and of the faculty; acquainting pharmacists with the pharmacy course and the faculty with the needs of pharmacists. In some instances the relation has been too distant and this applies not infrequently to the relation in universities of the medical branches. *The relationship should develop a friendship helpful to the members of these professions.*

THE NATIONAL FORMULARY AND THE PHYSICIAN, THE DENTIST AND THE PHARMACIST.*

BY ADLEY B. NICHOLS.[1]

The sixth edition of the National Formulary will soon become official and if the interest already shown in several of its new preparations is a criterion, the new book will prove a valuable asset to the physician, the dentist and the pharmacist. Certainly one senses to-day a greater feeling of coöperation on the part of these three professions, and it is not to be denied that the National Formulary may claim its due share in the development of this coöperation.

Development.—The N. F. was developed for the professions, a review of the several editions showing definite advances throughout its life. It is interesting to note that as far back as 1856 the AMERICAN PHARMACEUTICAL ASSOCIATION appointed a committee to collect "unofficial formulas in local use with many physicians of our union." However, there were so many formulas available for the same thing in substance, though differing in non-essential details of color, flavor, odor and proportions that the committee was unable to obtain favorable action on any specific one. Elixirs were just being popularized at that time, and the variations in this group resulted in the committee being dissolved. Years later, in 1883, there appeared two formularies, one on Elixirs, by John Uri Lloyd, and the other on local formulas of New York and Brooklyn, and these formed the basis for the first N. F. in 1888, known as the National Formulary of Unofficial Preparations. This title is interesting because it recognized a situation which still exists to-day. The United States Pharmacopœia was accepted as the official book and consequently the N. F. covered "unofficial" preparations. It acted as a stepping stone for the U. S. P., for if the latter provided standards and formulas of any article or preparation of the N. F., the authority of the latter ceased, as it does to-day. When the Food and Drugs Act made the N. F. and the U. S. P. official in character in 1906, the name of the former was officially changed to "The National Formulary."

Scope.—In the light of action taken by the N. F. VI committee, it is of interest to note that in the preface of the first edition of the N. F., a suggestion had been made to admit simple drugs or chemicals, but it was decided that the labor involved in the task already outlined was so great that no time could be devoted to any further additions. When it was suggested to the N. F. VI Committee that certain very popular simple drugs or chemicals be admitted, there were great misgivings on the part of many, it being claimed that the N. F. was established and had always been a book of formulas, and simples were out of place. Simples, however, had been admitted in the N. F. IV although only those which entered preparations and were not recognized by the U. S. P. were so included. On the other hand the N. F. was certainly trying to provide standards for the preparations which physicians were commonly prescribing and why should a popular item be omitted simply because it required no compounding or formula? Was not the public worthy of a

* Prepared for the Symposium on U. S. P. and National Formulary, Washington, D. C April 9, 1936.

[1] Secretary of the Committee on National Formulary.

standard of simples just as it was of a standard preparation? The final adoption of this proposed plan did not result in filling the new revision with everything in sight as many feared, but it did open the way for the proper recognition of such things as cerium oxalate, strontium bromide and many other very popular items.

Early in its deliberations the N. F. VI Committee agreed that "use by the medical profession" should decide what was to be admitted to the new book. This policy has been very closely observed and in order that there be a definite basis for the determination of this use, several surveys covering prescription ingredients were used. The largest of these reviewed about 121,000 prescriptions and from these several compilations the committee saw fit to delete 321 items which had been recognized in the N. F. V. Likewise 232 new monographs were added, most of which were products of extensive use, though some were required as pharmaceutical necessities in some form or another. Certain ones, like Syrup of Cherry, were added because it was felt that they would fill a valuable need in the armamentarium of the physician and the dentist. It should be understood that the National Formulary makes no claims of therapeutic efficiency for its many items, the fact that these items are extensively prescribed being considered all that is necessary to merit recognition. This policy is in direct contrast to that of the U. S. P. wherein every item, with the exception of pharmaceutical necessities and such preparations as vehicles, is definitely accepted upon its therapeutic value and proved merit.

The National Formulary is essentially a book of formulas, simples of both the U. S. P. and the N. F. being prepared in a manner convenient for administration. One who wishes to prescribe will thus likely find the item he desires available in a practical and palatable form, thus eliminating the necessity of being concerned, for instance, about the solubility of phenobarbital, whether it is water-soluble or alcohol-soluble and to what extent. In this particular instance one finds that a tasty elixir of phenobarbital is available representing $^1/_4$ of a grain of phenobarbital to each teaspoonful. The elixir is alcoholic since the chemical is not soluble in water. Or one may prescribe larger quantities of phenobarbital per teaspoonful by calling for the new iso-elixir which will be mentioned later. Thus solubilities are eliminated and incompatibilities are avoided. Thus also, one is not tempted to prescribe sodium phenobarbital in aqueous media, for, although it is soluble it soon decomposes and thus should preferably be used as a solid form of medication, as, for instance, in capsules or powders. Many other similar cases could be cited but time and space will not permit. Physicians and dentists are referred to the book or to their local pharmacists who will gladly coöperate in locating the most satisfactory form of administration for any specific item. Pharmacists must recognize that physicians and dentists are not as thoroughly acquainted with the official preparations as they are, and should therefore make every possible effort to pass on this information which is so mutually acceptable to all concerned.

NEW PRODUCTS.

While we may take for granted that every one is perfectly familiar with the general make-up of the N. F. and those products which have been handed down from the previous edition, there are many new preparations which are deserving of specific comment and these will be considered briefly.

VEHICLES.

For several years stress has been laid upon the numerous vehicles, elixirs and syrups of the N. F., and justly so, for they offer something as practical to the prescriber and the one for whom prescribed as is possible. That practical something is a tasty, palatable prescription, a simple thing which is so often sorely needed. Almost every physician is desirous of prescribing whatever medication is necessary in the most palatable and pleasing form, and a brief consideration of these N. F. preparations will open the way to better prescriptions. Every physician was not included in the previous statement, for it is known that there are certain patients who seem to require disagreeable and nauseating prescriptions, in order to be convinced that they are actually obtaining authentic treatment.

Syrup of Acacia.—Syrup of Acacia is a new addition and is presented as a specific vehicle and not just as a suspending medium in the old sense of the term. Acacia represents a colloidal type of product in which disagreeable substances may be dispensed, the colloidal action of the acacia preventing, in a large measure, the contact of the medication with the taste buds. Its use with substances such as urea should receive special consideration. It is flavored with vanilla and preserved with sodium benzoate. It might be added that a syrup prepared from whole acacia will produce a product superior in clarity and general appearance to one prepared from a powdered or granulated acacia.

Syrup of Cherry is another new addition to the vehicle fold, and one which has received very wide acclaim wherever it has been available. As a matter of fact it has received acclaim even where it has not been available and this situation has caused considerable annoyance. Its specific value lies in its fruity tartness, which makes it a delightful mask for some products such as the diluted acids, wherein the acid almost enhances the taste rather than destroys it. Unfortunately, the fact that the syrup is made from pure sour cherry juice and sugar will make it difficult at times to obtain the syrup in an off season. This very condition is found at the present time and it is regrettable, since it has been reported that many concoctions are being offered in lieu of the real syrup. Many of these, apparently, are likely not to simulate the true syrup in the least and thus will injure the legitimate use of the real material later on. The cherries which are used are the fresh, ripe, sour, pie cherries and not only the juice but also the crushed pits are included. The "open season" is not far away and from present indications it will be well for pharmacists to "stock up" and prepare for the busy twelve months ahead.

Syrup of Prepared Cacao or *"Chocolate Syrup"* is not a new syrup, although it has been markedly improved, but it is a valuable vehicle worthy of mention at all times. It is particularly desirable for the suspension and subsequent masking of insoluble substances, its heavy consistence materially aiding in preventing separation of the medication. It is often used with quinine salts. Its flavor and texture have been definitely improved.

Syrup of Cinnamon.—This also represents a vehicle which was previously official and, like syrup of chocolate, it has been improved from the pharmaceutical standpoint as it is now made by simple solution in place of the tedious percolation previously required. This syrup has come to be used specifically for the masking of the disagreeable taste of sodium salicylate. It offers a further advantage with the latter, since its natural dark color also masks the coloration so often observed with salicylate prescriptions in aqueous or colorless media.

Aromatic Syrup of Eriodictyon is again recognized and particular attention is called to its value as a vehicle for bitter drugs such as quinine and strychnine. Eriodictyon has been used for years as a mask for similar items and Dr. Bernard Fantus (1) has shown how it forms an insoluble and therefore tasteless product which is later readily assimilated. Dr. Fantus has been responsible largely for a number of these new vehicles and reference to the literature on a number of these products (2) would be well worth while.

Syrup of Glycyrrhiza.—This syrup is highly recommended for salty preparations such as the bromides. The natural sweetness of the syrup is followed by what has been termed a second sweetness due to the glycyrrhizin which is present. The preparation contains anethol, oil of fennel

and benzaldehyde in addition to fluidextract of glycyrrhiza. These added flavors enhance the natural flavor of the glycyrrhiza very materially.

Syrup of Raspberry, which has received such splendid recognition for its masking qualities of the salty preparations such as the bromides, is again recognized. Fifteen grains of a bromide per teaspoonful makes one feel that a pinch of salt has been added to bring out the flavor of the syrup. In this connection it might be well to state that syrups in general serve as the best masks for salty items, rather than plain water or elixirs which in fact intensify the saltiness.

This syrup, like syrup of cherry, is also prepared from the pure fruit juice and sugar. Consequently it, too, should be manufactured during the season of plenty. In the case of the syrup of raspberry, however, it is possible to obtain a concentrate which is made from the pure juice and sugar and this may be diluted with simple syrup and used, providing the finished product corresponds in color and taste to the one made by the original process and providing also that it produces a clear syrup on the addition of 50 per cent of alcohol.

Syrup of Thyme.—This syrup belongs to the vehicle class and offers a distinctive syrup for odor and taste, being more desirable for a change, even though the basic medication still may be the same.

A number of vehicle elixirs previously official have been recognized again. Among these there are offered vehicles of varying odors, tastes, alcoholic contents and colors. Thus one is able to change the vehicle from time to time while still maintaining the same medication throughout. This has been found to be a valuable feature in prescribing. Several such elixirs are as follows:

Compound Elixir of Almond, colorless, 4 per cent of alcohol; *Elixir of Bitter Orange*, yellow color, delightful taste, 28 per cent of alcohol which makes it valuable where high alcoholic content is necessary; *Red Aromatic Elixir* which is the aromatic elixir of the U. S. P. in a bright red jacket, alcohol content 23 per cent; *Compound Elixir of Cardamom*, pleasant flavor, colorless, 8 per cent of alcohol; *Glycerinated Elixir of Gentian*, yellowish brown, taste neither sweet nor bitter, alcohol content 13 per cent; *Compound Elixir of Vanillin*, amber color, very delightful odor and taste, alcohol content 8 per cent.

Aqueous Elixir.—Frequent objections have been raised over the presence of alcohol in many of the vehicle elixirs and there were many requests for a simple type of vehicle elixir without alcohol. These requests arose partly from the difficulty met in obtaining alcohol and partly from physicians who were desirous of having no alcohol whatever in their prescriptions. Aqueous elixir has been prepared to meet this demand. It is delightfully flavored, both odor and taste being very pleasant.

Iso-Alcoholic Elixir or Iso-Elixir provides a new innovation. It consists of a high and low alcoholic elixir both resembling aromatic elixir in odor and taste, and offering unlimited possibilities in prescription work. If an aqueous type vehicle is desired, the low alcoholic elixir, which contains about 10 per cent of alcohol, may be used, while the high alcoholic elixir with its alcoholic content of about 75 per cent may be employed for those substances which require a high percentage of alcohol for solution. The two elixirs are miscible and thus one may prepare a vehicle of any alcoholic strength between 10 and 75 per cent, dependent upon requirements. This feature has greater application than just to provide a solvent for a salt, however. Every one is familiar with the clouding produced when preparations like tincture of nux vomica or aromatic spirit of ammonia are prescribed with certain aqueous or even alcoholic vehicles. With Iso-Elixir available, it is prescribed as the vehicle, and the pharmacist, in filling the prescription, adjusts the amounts of the low and the high elixir so as to produce a product of approximately the same alcoholic strength as the tincture of nux vomica for instance, thus preventing any clouding effect. This is a decidedly forward step in the attempt to produce more elegant prescriptions. For convenience in calculating, a table is given which will aid in determining the quantities of each elixir to use.

AMPULS.

Twenty-eight of the most popular ampuls are recognized in the new N. F. together with quite an elaborate general chapter, covering the question of the selection of glass for ampuls, the preparation of the solutions, the technique of filling, sterilizing and testing for sterility. The individual monographs do not contain specific

formulas but contain tolerances, methods of sterilization and assay procedures. The tolerances are so worded that they apply to all sizes of ampuls. This section is a marked improvement for the book and places the manufacture of ampuls on the high plane where it rightfully belongs.

A special monograph has been included on *Redistilled Water*, which is required for ampul solutions. It produces a water which is practically free from pyrogens, that protein substance which is the cause of so much fever, discomfort and anxiety when used parenterally.

MEDICATED ELIXIRS.

In addition to the group of vehicle elixirs already mentioned, several new medicated elixirs have been placed in the N. F. VI.

Elixir of Aminopyrine contains about $2^1/_2$ grains of aminopyrine to each teaspoonful. It is pleasantly flavored with orange and contains approximately 20 per cent of alcohol. It has an attractive red color.

Elixir of Barbital, a dark brown elixir, flavored with the delightful compound spirit of vanillin, contains about 2 grains of barbital to each teaspoonful. The alcoholic content of the elixir is about 30 per cent.

Elixir of Phenobarbital is another of the new additions. It contains approximately $^1/_4$ grain of phenobarbital in each teaspoonful and it also is red in color. Its alcoholic content is about 20 per cent. It, too, is flavored with orange.

Elixir of Sodium Thiocyanate, or, as it is frequently designated, *Elixir of Sodium Sulfocyanate or Sodium Rhodanate*, has been added to the medicated elixir group. It contains $2^1/_2$ grains of the salt in each teaspoonful and is amber in color with a pleasant blended flavor.

EMULSIONS.

Several cod liver oil emulsions have been continued, of which the one with egg offers the finest type of preparation. An additional popular emulsion has been added, namely, *Emulsion of Liquid Petrolatum with Phenolphthalein*. This is a 50 per cent emulsion of heavy liquid petrolatum containing 1 grain of phenolphthalein to the average dose of a tablespoonful. It is emulsified with a combination of acacia and agar, so proportioned as to give a satisfactory product when prepared either by hand or by machine. The use of the hand homogenizer described in recent literature (3) produces an excellent product with a minimum of effort and is a sure guarantee to the pharmacist against "broken" emulsions.

GLANDULAR PRODUCTS.

Six glandular products have been recognized in the new N. F., namely, *Corpus Luteum*, *Ovary*, *Ovarian Residue*, *Anterior Pituitary*, *Whole Pituitary* and *Suprarenal*. The newly developed histological characteristics of the glandular products, so well prepared by Dr. Heber Youngken of Boston, opens an entirely new field in this line of work.

TABLETS.

Another one of the outstanding new features of the N. F. VI is the section devoted to tablets in which 48 new monographs appear. As in the case of ampuls, the monographs are primarily prepared as a means of control for the enforcement authorities and to provide uniform standards for manufacturers. No specific formulas are given, but the individual monograph is devoted to a tolerance statement

worded so as to cover tablets of all sizes, tests for identity and purity and a method of assay. For the most part, the tablets included are for simples only.

DENTAL PREPARATIONS.

A very valuable group of preparations of the new N. F. is that dealing with dental products. An associate committee of the American Dental Association consisting of Drs. Blayney, Aiguier, Dailey, Freeman and Timmons was primarily instrumental in the selection of these products for inclusion in the book and from preliminary reports we already know that its selections are most valuable.

N. F. Dentifrice or N. F. Tooth Powder comes first in the dental group. This is a basic powder only, composed mostly of precipitated calcium carbonate with only a trace of soap (5 per cent) and agreeably sweetened and flavored with a blend of soluble saccharin, oils of peppermint and cinnamon and methyl salicylate. This basic powder may be prescribed readily with sodium perborate or any desired medicament.

Glycerite of Iodine and Zinc Iodide, a modified or "Diluted Talbot's Solution" is next on the list. Every dentist is familiar with this popular preparation which has such marked antiseptic and astringent value in the treatment of pericementitis, gingivitis and lacerations.

Compound Dental Liniment of Aconite and Iodine is composed of 2 per cent of iodine, $2^1/_2$ per cent of fluidextract of aconite and 3 per cent of chloroform in a mixture of alcohol and water. It might be mentioned here that when a dentist prescribes tincture of aconite it is well for the pharmacist to consult him before dispensing the U. S. P. tincture which is 10 per cent, since the dentist invariably desires the once official tincture of 35 per cent strength. If this be the case, the prescription may readily be filled by using the proper amount of fluidextract of aconite carefully diluted.

Odontalgicum is the official Latin title for what was previously a toothache wax but is now a liquid under the English title of *Toothache Drops*. It is a solution of chlorobutanol in oil of clove and is extremely efficacious, each of the ingredients having marked obtunding properties. It should prove of marked value as a first aid for toothache.

Compound Paste of Acetylsalicylic Acid, popularly called "Dental Anodyne Paste," is a splendid dental anodyne for tooth sockets. It contains eugenol, which has a definite obtunding effect, peruvian balsam, which is antiseptic and promotes granulation, and acetylsalicylic acid which acts as an anodyne. These are incorporated in a base of white wax and wool fat. The directions for manufacture must be carefully observed lest the disagreeable separation of the balsam should occur, a problem which is familiar to most pharmacists and one which frequently causes difficulties.

Camphorated Phenol, composed of 30 per cent of phenol and 60 per cent of camphor in liquid petrolatum, is used as an antiseptic, devoid of topical irritation even to mucous membranes, in spite of its high phenolic content.

N. F. Aromatized Sodium Perborate is another one of the new dental items. It is agreeably flavored with oil of peppermint and soluble saccharin. Due to the large amount of this type of preparation being used by the layman without specific directions from a dentist or a physician, it might be well for the pharmacist to caution the customer about its promiscuous use when he sells the product. We realize how it has been the cause of severe mouth burns when used as a powder which lodges in cavities and eventually hydrolyzes to sodium hydroxide.

Solution of Procaine Hydrochloride, a sterile 2 per cent solution of the salt in normal saline solution, is a popular dental anesthetic. Solution of epinephrine hydrochloride is usually added in small amounts just before use. The latter gives a bloodless working field and prolongs the action of the procaine.

One or two additional products are of particular interest to the dental profession. *Alkaline Aromatic Solution* is a standard mouth wash of an alkaline character. *N. F. Antiseptic Solution*, which as you note has a slightly changed title, has been fortified as far as its antiseptic properties are concerned by the addition of chlorthymol. A few minor changes have also been made in the formula.

MISCELLANEOUS.

In addition to the many new items previously mentioned there are others of marked interest together with changes in old preparations, changes in titles and other general points of revision which can only be noted by a careful study of the book. Certain of the additional new monographs might be mentioned, however, and further details may be obtained later. Among these are *Solution of Boric Acid*, which is one of saturation; *Solution of Nux Vomica Alkaloids*, which is an aqueous solution prepared for veterinary use; *White Lotion*, which is the popular formula of the dermatologists and not the veterinary product as heretofore; *Syrup of Potassium Guaiacolsulfonate*, which contains about 5 grains of the salt per teaspoonful in aromatic syrup of eriodictyon; *Compound Ointment of Benzoic Acid*, or *Whitfield's Ointment*, which was greatly in need of uniform standardization; *Ointment of Coal Tar*, which contains 5 per cent of coal tar in paste of zinc oxide; and finally *Ointment of Scarlet Red*, which contains 5 per cent of scarlet red.

From the foregoing it must be admitted that the new National Formulary has been markedly revised and has something of vital interest for every one concerned. The physician will find a solution to the ever-present question of how to improve the palatability of his prescription and he will also find many popular items made available with a standard, uniform formula, the same in Maine as in Southern California. The dentist also will take advantage of these same items and in addition, the numerous specialty preparations made available primarily for dental use. The pharmacist will be in a position to suggest these items and to supply them to the several professions, thereby not only assisting the several professions, but the general public as well, to say nothing of the automatic development of his own professional standing.

REFERENCES.

(1) JOUR. A. PH. A., 4, 323 (1933).
(2) *Ibid.*, 7, 698 (1934); 8, 812 (1934); 8, 915 (1934); 1, 46 (1935).
(3) *A. J. P.*, April 1935.

LATIN-AMERICAN DELEGATES HOLD CONFERENCE AND SYMPOSIUM ON THE PHARMACOPŒIA.

The national Directors of Health of the Pan-American Conference and other representatives of the Health Departments of the Latin-American countries were in conference at the Pan-American Sanitary Bureau in Washington during the week of April 5th.

As the Spanish translation of the new United States Pharmacopœia has been undertaken as an official act by the Pan-American Sanitary Bureau and is now well under way with considerable material in the form of proof, the Latin-American delegates were invited to participate in a conference and symposium on Pharmacopœias.

The invitation was extended by the officials of the AMERICAN PHARMACEUTICAL ASSOCIATION and the delegates were the guests of the ASSOCIATION for the conference, followed by a reception.

President Walter A. Bastedo, of the Pharmacopœial Convention, presided at the conference and welcomed the delegates, and outlined the objectives of the Board of Trustees in preparing a Spanish edition of the United States Pharmacopœia.

A number of the delegates responded expressing their appreciation of the service which the U. S. P. Board had rendered in supplying the latest scientific standards for a large number of im-

portant medicinal agents and for the nucleus which this offered for a possible Pan-American Pharmacopœia.

The need for uniformity in titles and in potency for standard medicines and also the importance of having uniform tests and assays for international use was emphasized.

Dr. B. J. Lloyd, Assistant Director of the Pan-American Sanitary Bureau, discussed the service which the Bureau was undertaking in translating the Pharmacopœia and expressed the hope that the monthly bulletins of the Bureau would be helpful in extending interest and the benefits of this publication.

Dr. A. A. Moll, who is associated with the Pan-American Sanitary Bureau and is one of those translating the Pharmacopœia, discussed the objectives of this service and some special features of the book.

Chairman E. Fullerton Cook, of the Revision Committee of the U. S. Pharmacopœia reviewed important features of the new Pharmacopœia.

It was clearly set forth that the Pharmacopœia of the United States, which had already been translated into the Spanish language for three successive decades, had been primarily developed for use in Porto Rico and the Philippines and had been the official Pharmacopœia of Cuba since the first translation, which was 30 years ago.

The assistance of the scientific staff of the University of Havana in the preparation of the previous translations was emphasized and credit given them, especially José Guillermo Diaz, for his personal translations of the U. S. P. VIII and IX and his active participation in the translations of the U. S. P. X, the details of which were carried out by a committee at the University of Havana.

All of the members of the Auxiliary Commissions of the U. S. P. XI from Cuba, Porto Rico and the Philippines are again actively associated with this translation.

The fact was emphasized that the Board of Trustees in submitting this Spanish translation to all Pan-American Republics was doing so with the hope that the scientific facts and official texts might be useful in the revision of their own Pharmacopœias, and also that it might be helpful in all of these Republics in supplying information concerning modern medicines.

The Chairman of the Council, S. L. Hilton, the Vice-President of the A. PH. A., F. A. Delgado, the Secretary, E. F. Kelly, and Editor E. G. Eberle participated in the meetings and reception, representing the AMERICAN PHARMACEUTICAL ASSOCIATION at the National Headquarters.

Following the meeting the delegates studied the official preparations of the New U. S. P. and N. F. which had been placed on display at the A. PH. A. Headquarters Building and were then the guests at a reception and tea presided over by Mrs. Kelly, Mrs. Eberle and Mrs. Delgado.

PHARMACY WEEK WINNERS.

Nathan Fried, 1024 West 63rd St., Chicago, Illinois, was awarded the Federal Wholesale Druggists' Association Trophy for the winning Pharmacy Week Window for 1935, according to announcement from Chairman Anton Hogstad, Jr., National Pharmacy Week Executive Committee. This window is complete and interesting, telling a logical story, step by step. (See page 273.)

Merit certificates were awarded as follows:

MERIT CERTIFICATE NO. 1.

Meadows Pharmacy, Philadelphia, Pennsylvania. Display outstanding from standpoint of artistry and simplicity. "Drugs in the Scriptures" theme.

MERIT CERTIFICATE NO. 2.

Hubbard's Drug Store, Newton, Massachusetts. Background of this display is a neatly arranged open-view prescription department featuring in the foreground a display of crude drugs, the finished products, signs relating to Pharmacy Week and the different branches of Pharmacy.

MERIT CERTIFICATE NO. 3.

Fireman's Pharmacy, Newark, New Jersey. Display brings out the professional character of the pharmacy and the importance of the pharmacist when human life is in the balance.

MERIT CERTIFICATE NO. 4.

Weber & Judd, Rochester, Minnesota. A comprehensive, educational display, attractively arranged.

MERIT CERTIFICATE NO. 5.

Morgan & Millard, Baltimore, Maryland. A display deserving a higher award, had it not been for numerous items displayed which could have been compounded by the pharmacist.

MERIT CERTIFICATE NO. 6.

Oliver's Pharmacy, Pratt, Kansas. A display depicting the educational requirements necessary to become a pharmacist.

MERIT CERTIFICATE NO. 7.

O'Brien Drug Company, Omaha, Nebraska. This display relates the story of the origin of drugs in a very descriptive manner.

MERIT CERTIFICATE NO. 8.

Jesse C. Price, Beverly, Ohio. A novel display, well expressed, acquainting the public with the existence of the AMERICAN INSTITUTE OF PHARMACY.

MERIT CERTIFICATE NO. 9.

Boerner's Pharmacy, Iowa City, Iowa. An excellent display, featuring the Ethics of Pharmacy, supported by a display of U. S. P. and N. F. preparations. (See page 276.)

MERIT CERTIFICATE NO. 10.

Service Pharmacy, Washington, D. C. A well-balanced display of crude drugs and prescription equipment.

THE LOSS BY STORMS AND FLOODS.

Pharmacists, as others, suffered great losses and relatively greater, because damage to drug stores in many cases meant destruction of property. Sympathy is a source of encouragement, but more than that is needed, therefore the efforts to relieve are worthy of commendation. Following the disastrous floods in a number of states, a devastating storm destroyed much property in six southern states. All of Gainesville, Ga. drug stores were destroyed or damaged. Pharmacist R. D. Griggs and six members of the family were killed.

The *Pennsylvania Pharmacist* has an account of the floods in various parts of the state, notably in Johnstown; Williamsport, Pittsburgh and other cities were sufferers. New England sustained great losses and so did Cumberland and other localities in Maryland. Secretary J. Lester Hayman in the monthly West Virginia *Bulletin* reports on losses in West Virginia. Ohio and other states suffered greatly and in all reports the wonderful spirit of brotherhood is shown by thinking of others. Those who were fortunate in not having been afflicted should *and do* think of the less fortunate. There has been a fine response, but with all of that the great majority suffered to a far greater extent than pride will permit them to admit.

Breon Drugstore, Williamsport, Pa., during the flood; water at its height measured nearly 7 feet.

PROCEEDINGS OF THE LOCAL BRANCHES

"All papers presented to the Association and Branches shall become the property of the Association with the understanding that they are not to be published in any other publication prior to their publication in those of the Association, except with the consent of the Council." —Part of Chapter VI, Article VI of the By-Laws.

ARTICLE III of Chapter VII reads: "The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, *and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it.* And no local branch shall enact any article of Constitution or By-Law to conflict with the Constitution or By-Laws of this Association."

ARTICLE IV of Chapter VII reads: "Each local branch having not less than 50 dues-paid members of the Association, holding not less than six meetings annually with an attendance of not less than 9 members at each meeting, and the proceedings of which shall have been submitted to the JOURNAL for publication, may elect one representative to the House of Delegates."

Reports of the meeting of the Local Branches shall be mailed to the Editor on the day following the meeting, if possible. Minutes should be typewritten with wide spaces between the lines. Care should be taken to give proper names correctly and manuscript should be signed by the reporter. *Please advise us of changes in Roster and mail reports promptly.*

BALTIMORE.

The Baltimore Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION held its March meeting at the Emerson Hotel, March 25, 1936. On this occasion a joint meeting was arranged with the Baltimore Retail Druggists Association because of the mutual interest of members of both organizations in the subjects listed for discussion by guest speakers of the two groups.

An informal supper, which preceded the regular meeting, was tendered by the Baltimore Branch for visiting speakers. At this supper about twenty-five members of the two organizations joined in greeting Dr. E. Fullerton Cook, *Chairman* of the Revision Committee of the U. S. Pharmacopœia, who was the guest of the Baltimore Branch for the evening. Herbert Levy, Counsel for the Maryland Pharmaceutical Association, who was scheduled to appear as the guest of the Retail Druggists Association, was unable to attend either the supper or the meeting. The hotel chef provided an excellent supper, which was enjoyed by all those present. At the conclusion of the meal President Hewing called on several members of the Baltimore Branch, and on President Kronthal of the retail association to extend greetings to Dr. Cook.

The regular meeting was called to order at 8:30 P.M. by President Hewing. About sixty members and guests were present. The minutes of the previous meeting of the A. PH. A. Branch were read by the secretary, and approved. Communications to the Baltimore Branch from President Costello of the parent association, and from Dr. Ernest Little, of the Northern New Jersey Branch, were also read. Both of these communications urged redoubled efforts on the part of members, and the membership committee, in aiding the current drive to increase the membership and prestige of the AMERICAN PHARMACEUTICAL ASSOCIATION. As time was not available for a proper discussion of this subject, no formal action was taken at this meeting.

President Hewing then introduced the guest speaker, Chairman E. Fullerton Cook, who spoke on the U. S. P. XI and on various phases of the work being carried on by the Committee on Revision. This address proved of exceptional interest to those present at the meeting. For the benefit of other members, a summary of some of the interesting points developed by the speaker will be reported. At the conclusion of his address Dr. Cook was offered a rising vote of thanks. Discussion of the address was somewhat limited due to lateness of the hour and the fact that a second speaker was scheduled to follow on the program for the evening.

At this point President Hewing of the Baltimore Branch called President Kronthal of the Baltimore Retail Druggists Association to the chair. President Kronthal offered an expression of appreciation from this group to Dr. Cook for his instructive address.

In the absence of Mr. Herbert Levy, who was scheduled to address the meeting on "The Importance of the California Supreme Court Decision to the Fair Trade Movement," Dr. Robert L. Swain was called on to present this subject. Dr. Swain stated that he had been requested by Mr. Levy to discuss this court decision at some length, but because of his extended editorial com-

ments on this subject, appearing in the March issue of *The Maryland Pharmacist*, he felt that a further lengthy discussion on his part would be superfluous. He preferred to discuss the matter very briefly.

In his comments on the decision of the Supreme Court of California which upheld the constitutionality of the "Fair Trade Law" of that State, Dr. Swain contrasted the method of presentation of this case in court, and the extended study given to legal questions involved by the California Court, with the basis of action and manner of presenting a case involving similar legal points in the courts of the State of New York. The adverse decision in the latter case, which robs the New York law of much of its effectiveness, was believed to be due both to the inadequacy of the points raised in defense of this law, and to the hasty manner in which facts were presented and a decision rendered. Some difference in phraseology of the constitutional provisions governing the cases presented in the two states existed, but such did not appear to be of sufficient importance to account for differences in the opinions rendered. It appeared from published accounts of this legal action that no serious attempt was made to prove that the appellant in the New York case had been actually damaged by the acts complained of; whereas in the California case such damage to the complaining manufacturer was made the principal cause of action, and that actual damage was proved to the satisfaction of the Court to have occurred.

The California court found that the State Legislature had the power to set up a standard of economic policy for that State, and that it also had the right to protect contractural relations within the State against detrimental influences, when such protection was essential to the general welfare.

It was pointed out that the California court had taken cognizance of the previous adverse decision of New York Courts which invalidated sections of a law which were practically identical with provisions of the California statute. After a thorough study, however, it was ruled that the incidental fixing of minimum resale prices in California contracts did not violate any constitutional or common-law rights of contracting parties in that State. The validity of this fair trade act in respect to its application to dealers who refuse to contract with a manufacturer to maintain minimum resale prices for his product was upheld.

This decision was rated by the speaker as a major victory for advocates of price stabilization in the retail drug field. He predicted that a renewed impetus would be given to efforts to have similar fair trade laws passed, and made effective, in other states.

At the conclusion of this summary by Dr. Swain, President Kronthal expressed the opinion that the decision noted would have an immediate beneficial effect in Maryland—efforts of the price-stabilization committee in Baltimore having necessarily been of an uncertain and wavering nature since the adverse decision affecting fair trade contracts in New York State had been rendered.

No new business being presented to the meeting, a motion to adjourn was entertained, and carried.

ROBT. S. FUQUA, *Secretary*.

THE NEW PHARMACOPŒIA AND ITS VALUE TO PHARMACISTS.*

BY E. FULLERTON COOK.

The speaker, who has been chairman of Revision Committees for both the tenth and eleventh revisions, first sketched the historical background of these revisions, and noted the changing attitude toward the use of drugs as therapeutic aids in the treatment of disease on the part of a majority of the prominent medical practitioners in recent years. He recalled the days of Osler, and others of that period in medical history when many prominent physicians were demanding both experimental and clinical proof of the value of all drugs used; when absolute proof was either lacking in many cases, or difficult to obtain. Some of these men voiced opinions that very few of the drugs available at the time were of any real value in combating disease. More recent years have found leaders of the medical profession re-discovering some of the old remedies, as well as many new ones, but to-day's acceptance is based largely on scientific evidence and clinical proof. Fortunately for the Pharmacopœia the extreme views held by various groups have never been de-

* Abstract prepared by Robert S. Fuqua of the address before Baltimore Branch, A. PH. A., March 26, 1936.

termining factors in the revisions of this work. We are also fortunate in that the work of thousands of trained investigators is now available to aid the Committees of Revision in their efforts to improve the efficacy of standard remedial agents, and to provide others for which a real need exists. The point was stressed that during this period, as from the date of its inception, the U. S. Pharmacopœia has always kept pace with changing conditions and increasing knowledge in the medical and pharmaceutical field.

The present policy of the Committee is to provide an efficient medicine for every therapeutic need when such are known and are available. Unfortunately some of the newer important remedies must be omitted from the new U. S. P. XI because of the unwillingness of certain patentees to have their products included. The speaker referred to Insulin as one such item in which the question of dual control of standards was raised. The Insulin Committee will control this product until the patent expires in 1942, when both the product and the name Insulin will be available for inclusion in the Pharmacopœia.

The wisdom of the policy of interim revisions has been amply demonstrated during the life of the U. S. P. X. Such new products as assume importance in the treatment of disease can be included if a definite need for the inclusion exists. New remedies are constantly being brought forward, and confusion as to important drug constituents are gradually being cleared up. Mention was made of interim revisions of the standards for Cod Liver Oil, Ergot, Oil of Lemon and Milk of Magnesia: In the case of the latter item the omission of a stated process of manufacture by *interim revision* averted a threatened difficult situation for pharmacists and drug manufacturers. Revision of the standards for Oil of Lemon permits us to use a domestic oil of high quality which now offers strong competition to foreign material. The difficulty encountered in having the issuance of interim changes in tests, changes in nomenclature or correction of typographical and other errors which appear in published text, properly publicized was stressed by the speaker. It was stated that something like forty minor errors in the text of the eleventh revision have already been called to the attention of the Revision Committee. This, despite the numerous readings of all monographs and proof sheets by many different individuals before publication. It is proposed, in the case of the new Pharmacopœia, that annual supplements shall be issued in pamphlet form in which all changes or corrections made during a given year will be included. These will be available on requests sent to the Revision Committee. A suggested second edition of the U. S. P. XI, after five years have elapsed, would include all changes made up to that date.

Certain changes, additions and deletions, etc., occurring in the Eleventh Revision, were mentioned briefly. A detailed listing of these changes by Mr. Samuel Fox of Baltimore, which is now being published in *The Maryland Pharmacist*, is a service to pharmacists of the Maryland district which was touched on and the author complimented by the speaker; who also called to our attention the important contributions made to the huge task of pharmacopœial revision by Maryland pharmacists, research workers and teachers.

Particular attention was directed to many interesting changes appearing in the General Notices section of the new U. S. P. Permission is now given to use drugs which differ from U. S. P. standards of strength for the extraction of alkaloids or other active principles, but it is directed that only drugs complying with official standards may be used in the manufacture of official pharmaceutical preparations. This provision will settle a question which has occasioned much controversy and differences of opinion in the past; particularly in the legal enforcement of Pharmacopœial standards by Governmental agencies. A second provision will provide safeguards against deterioration of several important drugs during shipment from foreign countries, or in interstate commerce. The new Pharmacopœia will require that digitalis and ergot must be preserved under all conditions of storage and transportation in waterproof and air-tight containers. Import shipments of these drugs which are not so packed after June 1st will not be admitted at U. S. ports, and interstate shipments will be illegal under the present Federal food and drugs act. This provision should result in a considerable improvement in the potency of imported stocks of the above-mentioned drugs offered for sale in American markets. Among other changes, the U. S. P. XI directs that distilled water shall be used in all official preparations. This provision is worthy of note; and was dictated by the fact that much variation in purity exists in the potable water of different sections of this country, and in its island possessions and territories. To secure greater uniformity in the dosage of potent medicines usually directed to be taken by drops, an official medicine dropper is defined in the new Pharmacopœia. Efforts are being made by the

Revision Committee to the end that an adequate supply of such droppers will be available to druggists when provisions of the eleventh revision become effective.

Regarding the quality and purity of all medicinal substances for which official standards are set up, the speaker stated that an honest effort had been made by the revision committees of both the Pharmacopœia and the National Formulary to provide physicians and the public with medicines of superior and uniform quality and potency. Standards are designed to assure a maximum of potency, without necessitating the sometimes prohibitive cost of removing all traces of harmless impurities. Attention was called to the fact that, aside from standards of strength, the U. S. P. sets up minimum standards for purity rather than maximum. A recognized drug of official strength but exceeding minimum requirements as to purity will still be a U. S. P. product. The speaker deplored the fact that some firms offer trade-marked official products to physicians with the statement that these are of superior purity or potency to other standard brands carrying the U. S. P. designation on labels. Such a practice tends to discredit U. S. P. products in the minds of physicians, while offering no therapeutic advantage to patients. Mention was made of the efforts of the present revision committees which have been directed to the problem of providing a greater variety of palatable official vehicles for the administration of nauseous medicines, and to the improvement in this respect of old established formulas.

The speaker also disapproved of the idea of promoting the use of U. S. P. or N. F. products by advising physicians that prescriptions for these medicines can be filled by pharmacists at much lower costs to patients than prices charged for proprietary remedies. In the first place many official drugs are costly items, and secondly, overhead and service costs are approximately the same regardless of the products dispensed. Usually the difference in costs of materials used is not sufficiently great to result in any decided lowering of prices for finished prescriptions. Emphasizing the fact that U. S. P. or N. F. items are cheaper may convey to physicians the idea that possibly these products are inferior to others on the market. He advocated instead a policy of instilling in physicians the thought that U. S. P. and N. F. drugs and preparations offer highly standardized and therapeutically effective medication. This policy was advanced as offering an ethical, and in the long run more effective way of promoting the use of these standard drugs and preparations in prescriptions.

Many changes are incorporated in the monographs on drugs and chemicals in the eleventh revision. Various tests have been revised in the interest of greater accuracy or uniformity of results. Both minimum and maximum standards of strength are included in some cases where only one has previously appeared. Strengths of some of the concentrated mineral acids are increased. The strength of some important chemicals is increased by reducing the amount of water of hydration. So many changes of this character have occurred that a thorough perusal and check-up of the new edition should be made by all pharmacists. Preparations made up according to new formulas with U. S. P. X chemicals and drugs may require revision as to quantities used, and in filling prescriptions variations as to dosage may be necessary. Physicians should be acquainted with any important changes in strengths of preparations customarily prescribed.

Several new departures in the procedure and activities of the U. S. P. Revision Committee are now in effect. Due to difficulties encountered in setting up satisfactory standards for certain new medicinal products, work is to be continued by the committee along several lines requiring further investigation. Two Pharmacopœial Advisory Boards, composed of expert investigators, have been set up. One of these will continue the study of vitamin products; while the second will work out methods of standardization of anti-anemia remedies. Another study which will continue for several years will deal with digitalis. This latter study is of an international character, and engages experts in several countries.

A new, and perhaps very significant, activity of the Revision Committee will be the sponsorship, in coöperation with officials of the American Medical Association, of a series of articles dealing with the use of official drugs and preparations in the treatment of various diseases. These articles will be written by outstanding physicians, and will be published each two weeks during a year in the *Journal of the A. M. A.* It is proposed to also publish this set of articles in the pharmaceutical journals for the information of interested pharmacists.

The new Pharmacopœia is now being translated into the Spanish language for use in Cuba and Puerto Rico where it is the official standard; and also to permit the use of this volume in certain South American Countries which have no national Pharmacopœias at this time.

CHICAGO.

The 236th monthly meeting of the Chicago Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held Tuesday evening, March 17th, at the University of Illinois College of Pharmacy.

Dr. Ralston, of the Research Department of Parke, Davis & Company spoke on the subject of "Hormones and Endocrines." He opened the discussion with a general outline of the subject and mentioned that for a comprehensive study of Endocrines the physiologic, chemical and medicinal aspects should be considered.

In order to present the subject, compromise between the physiologist and the biochemist has been effected, as will be noted in the following table in which the endocrine glands and their hormones have been arranged into five groups, the position assigned to a given hormone being dependent upon the progress that has been made in its physiological and chemical study. The following table presents the 1935 status of Endocrine Research:

1. *Predemonstration Phase*, which consists of those endocrine glands in which the presence of an active principle has not yet been conclusively demonstrated. An example is the pineal gland.

2. *Demonstration Phase*, which consists of those in which the presence of a hormone has been demonstrated by means of animal experimentation, usually through the medium of replacement therapy. Examples are: Thymus, Intestinal Tract and Anterior Pituitary.

3. *Concentration Phase* is made up of those endocrine glands the active principle of which has been extracted and concentrated and thus obtained in a considerably more potent form than occurs in the gland itself. Examples are: Parathyroid, Suprarenal, Cortex and Anterior Pituitary (the Gonadotropic, Thyreotropic, Lactogenic and Growth-promoting Hormones). It will be noted that Anterior Pituitary also occurs in Group 2. This is in reference to the Adrenalotropic, Fat Metabolizing, Pancreatropic, Parathyreotropic and Diabetogenic principles that have been claimed.

4. *Isolation and Analysis Phase*, which contains those hormones which have been isolated in substantially pure form or from which multiple hormones have been efficiently separated from one another. This group includes Pancreas (Insulin), Intestinal Tract (Secretin), Posterior Pituitary (Alpha-hypophamine, Beta-hypophamine, Theelin and related principles), Ovary and Testis.

5. *Synthetic Phase*, which contains hormones which have passed through the preceding stages and, in addition, have been duplicated by chemical synthesis. In this group will be found Corpus Luteum, Thyroid and Epinephrine.

Slides were shown at this point showing the advancement of Endocrinology.

Dr. Ralston pointed out the interrelationship between the endocrine glands. The active principles secreted by a given gland may markedly influence certain other endocrine glands. Glandular therapy cannot offer a cure for conditions due to a natural deficiency; it is replacement therapy only, and at best can give only temporary relief. An example of this is the use of Insulin.

The Pituitary Gland seems to have a multiplicity of functions. Instead of exerting a specific effect on one particular organ or on one type of cell, it appears to be the headquarters for chemical messengers which stimulate most of the other endocrine glands, and hence, indirectly, almost every cell in the body. Pressor and oxytocic hormones have been isolated from the Posterior Lobe. Many developments have occurred recently in the Anterior Pituitary field.

The Anterior Lobe has been found to supply a growth promoting hormone (Antuitrin-G) and a general sex hormone or gonad stimulating hormone. The urine of pregnant women contains a gonad stimulating principle possessing Anterior Pituitary-like activity. It is available under the name of Antuitrin-S. Whether or not this pregnancy urine principle is of Pituitary origin has been a matter of controversy. Recent work has led to this belief.

The observation that menstruation does not occur in castrated women is attributed to Negrier (1831). From that time until the beginning of the present century many theories as to the cause of the menstrual cycle were evolved. Fundamental studies which have now established

menstruation as an endocrine phenomenon can be only briefly mentioned. Observations on the function of corpus luteum; effect of ovarian transplants; periodic endometrial changes; the estrus cycle of laboratory animals; correlation of ovarian and endometrial cycles; and finally the recognition of an ovary-stimulating hormone of the anterior hypophysis have been landmarks of progress. These combined with the isolation and study of the ovarian follicular, estrus-producing hormone theelin, and the corpus luteum hormone progestin justify our present concept of the physiology of the menses.

Under the influence of gonadotropic hormone secreted by the anterior lobe of the Pituitary body, a primordial cell of the ovary becomes a mature graafian follicle, with subsequent ripening of the ovum. The follicle elaborates the ovarian follicular hormone, estrin or theelin, which stimulates proliferation and growth of uterine endometrium. The production of theelin continues up to and beyond the time when the ovum is released by rupture of the follicle about the 14th to 16th day of the menstrual cycle, at which time the endometrium stimulated by theelin has attained its optimal growth. Following ovulation, or discharge of the ovum, the granulosa and theca internal cells of the follicle, due to continued influence of the anterior hypophysis, undergo characteristic changes to form nature corpus luteum. This body begins to elaborate its own hormone, progestin. The corpus luteum continues to produce estrin in increasing amounts, as well as progestin which prepares the endometrium for nidation of the ovum that is traversing the fallopian tube. The endometrium becomes more vascular; the glands distend, become tortuous and filled with secretion.

If the ovum has not been fertilized the corpus luteum undergoes degeneration, with consequent cessation of hormone production. The luxuriant uterine mucosa without the support of the luteal hormones undergoes rapid degeneration. Its discharge from the uterus accompanied by a bloody flow about the twenty-eighth day constitutes the objective manifestation signifying completion of the cycle. With the onset of flow another follicle starts on a similar course and the epoch is repeated. The normal menstrual cycle depends therefore, on properly developed and matured gonads that respond to the cyclic stimulation of a normally functioning Pituitary Body.

The discovery of a gonad-stimulating hormone in pregnancy urine by Zondek and Aschheim in 1928, along with the crystallization of theelin by Doisy in 1930, opened the way for clinical application of many facts established in the laboratory. Implantation or injection of certain extracts of anterior hypophyseal tissues have been shown to induce follicle formation and follicle luteinization in the ovaries of laboratory animals; injections of Antuitrin-S, or the anterior pituitary-like hormone of pregnancy urine, produce the same effect except for recognized fundamental differences in the mode of action.

Clinical Application—Antuitrin-S (the Anterior Pituitary-like Sex Hormone) may be used by hypodermic injection in females in the treatment of functional uterine bleeding, amenorrhea, dysmenorrhea and hyperthyroidism. In males for the treatment of undescended testes, eunuchoidism, aspermia and impotence.

Theelin (the crystalline estrogenic hormone, keto-hydroxy-estin) may be used in the treatment of menopausal disturbances, menstrual disturbances, senile affections, endocrine deficiency, retarded sexual development. This must be administered by hypo.

Theelol—(the crystalline estrogenic hormone known chemically as tri-hydroxy-estin). This is given for the same conditions as those in which Theelin is used but is effective only in oral administration.

The lateness of the hour prevented Dr. Ralston from continuing with the discussion of the hormones, elaborated by the endocrines.

An exceptionally large audience was present. Many of those present took advantage of the opportunity to clarify opinions held by asking Dr. Ralston questions pertaining to his discussion and general questions on endocrinology.

L. TEMPLETON, *Secretary.*

OFFICERS.

The officers of the Chicago Branch, A. PH. A., elected at the January meeting for 1936 are: *President*, S. W. Morrison; *First Vice-President*, H. M. Emig; *Second Vice-President*, R. A. G. Linke; *Third Vice-President*, O. U. Sisson; *Secretary-Treasurer*, L. Templeton; *Delegate to the House of Delegates*, L. Templeton.

Committee Chairmen: *Membership*, Thomas F. Rylands; *Legislation*, J. Riemenschneider; *Practice*, I. A. Becker; *Medical Relations*, Dr. Bernard Fantus; *Publicity*, A. E. Ormes.

LAWRENCE TEMPLETON, *Secretary-Treasurer*.

NEW YORK.

The March meeting of the New York Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was held March 9, 1936, at Columbia University, College of Pharmacy.

The meeting was called to order by Past-President Charles W. Ballard, acting for President Schaefer. The minutes of the previous meeting were read and approved. The report of Treasurer Currens was presented.

Chairman Hauck, of the Committee on Membership, reported progress and presented the application of Walter Franklyn Riker, Jr., for membership in the parent organization.

Chairman Lehman, of the Committee on Legislation and Education, read his report as follows:

"An attempt will be made to pass the Robinson-Patman Bill in the Senate immediately after it is passed by the House.

"It is stated that the Senators from the State of New York are not favorably disposed to above bill: it would be advisable to communicate with Senators Copeland and Wagner, asking them to give their support to the measure, S. 3154 (H. R. 8442).

"It is to be hoped that the same amount of energy will be put behind the Tydings Bill (Fair Trade) S. 3822, which legalizes price contracts between manufacturers and distributors in such states where such contracts are legal.

"The Doughton Bill H. R. 11452 proposes to abolish the Bureau of Narcotic Control and place its functions under the Secret Service together with the Alcohol Tax Unit. This legislation is opposed by the pharmaceutical interests. The bill is now before the Ways and Means Committee of the House.

"*State Legislation*.—A bill to eliminate fraudulent, deceptive and misleading selling and advertising practices in retail and wholesale trades, and creating a 'State Distributive Commission' of three members to enforce the provisions of the law, has been introduced in the New York State Legislature by Senator Jacob A. Livingston of Brooklyn, a Democrat. The bill will outlaw Loss Leaders and other price demoralizing methods.

"The Anti-discrimination bill sponsored by the New York State Pharmaceutical Association was introduced in the State Senate by Senator Feld, and has been referred to the Committee on Codes. It prohibits the owners of retail drug businesses or of stores which have a drug department from selling or advertising for sale any drug, cosmetic, toilet preparation or drug sundry at a price below the manufacturer's list price per dozen. This is a measure similar to the Connecticut Law.

"The California Fair Trade Law was upheld by the Supreme Court of California, in the case of Max Factor against Kunsman based on Section 1½ which forbids the sale of a commodity for less than the price stipulated in any contract, even if the seller is not a party to the contract. This is the section that was declared unconstitutional by the New York Courts.

"*Local Legislation*.—The Department of Health is again proposing an amendment to Section 115 of the Sanitary Code, which requires annual registration of all patent and proprietary medicines and the payment of a fee for each annual registration. This proposal had been made last fall, but was withdrawn with the understanding that the Copeland Food and Drug Bill would be enacted by Congress. As this does not appear to be the case, the matter of control by registration has been brought up again, and is protested by drug interests."

Under communications: A very interesting letter from Patrick H. Costello, president of the AMERICAN PHARMACEUTICAL ASSOCIATION, was read.

Chairman Ballard then introduced the guest speaker of the evening, Joseph J. Hammer, who spoke on the "First Pharmaceutical Credit Union in America."

Mr. Hammer's talk explained the difficulties encountered in getting the charter from the federal government. He explained the nature of the credit union, its objects to inculcate systematic savings and to lend money to its members for useful purposes.

He explained the method of borrowing money, forms of security accepted, interest rates and

other charges. He pointed out that membership is limited to registered pharmacists who are members of the New York State Association.

Mr. Hammer also expressed the wish that manufacturers and wholesalers would become members of the union. He assured them that they would have representation on the Credit Committee, that they would have a fair return on the money invested and that the money borrowed would in large part return directly to them.

After the discussion in which several members took part a rising vote of thanks was extended to the speaker. HORACE T. F. GIVENS, *Secretary.*

NORTH PACIFIC.

The North Pacific Branch of AMERICAN PHARMACEUTICAL ASSOCIATION held a meeting on December 17, 1935, at 8:00 P.M. at North Pacific College. Thirty-five were present.

The meeting was called to order by Dean A. O. Mickelsen. A paper was read by Mr. M. Frederick Grill on the changes in the U. S. P. XI. He discussed the important changes and gave his opinion regarding them. Harvey J. Donnell gave a talk on benzoinated lard.

Dean A. O. Mickelsen announced that officers for the ensuing year would be elected at the meeting on January 14, 1936.

Fred Felter moved that a nominating committee be appointed from the chair; seconded by Frank Nau.

The following committee was appointed: *Chairman*, Walter Rhodes, Fred Felter and Fred Geue.

An open discussion followed on unfinished business.

President, Dean A. O. Mickelsen announced that the next meeting would be held at North Pacific College on January 14, 1936, and would be in charge of the Committee on Education and Legislation.

HARVEY J. DONNELL, *Secretary.*

JANUARY.

The monthly meeting and annual election of officers of the North Pacific Branch of the A. PH. A. was held January 14, 1936, at the North Pacific College. Thirty-seven members were present.

Frank Nau discussed Fair Trade Legislation, State and National, and reviewed legislative matters which affect the pharmacist.

J. J. Lynch, Manager of the O. S. P. A., discussed the Sales Tax and explained how it would be a burden on retail pharmacy.

Professor Ernest T. Stuhr, of the Oregon State College School of Pharmacy, presented a paper on the "Education of a Pharmacist," which was read by Fred Felter, due to the absence of Professor Stuhr.

Chairman Walter Rhodes, of the Nominating Committee, reported the following nominations for offices for the year 1936: *President*, Fred A. Geue; *First Vice-President*, George Haack; *Second Vice-President*, M. Frederick Grill; *Secretary and Treasurer*, Harvey Donnell.

It was moved by Fred Felter and seconded by Frank Nau that the report of the nominating committee be accepted, and the secretary cast a unanimous ballot for the election of these officers. The motion was carried.

The new officers were installed by Dean A. O. Mickelsen, who presented President Fred A. Geue, with a sturdy gavel which Dean Mickelsen had made of Oregon Myrtle and Yew wood, and expressed his gratification to the members for their loyal support during the past year, as president.

President Geue then made a few remarks of appreciation and urged continued support of the good work done by Dean Mickelsen.

HARVEY J. DONNELL, *Secretary.*

FEBRUARY.

The monthly meeting of the North Pacific Branch of the A. PH. A. was held at North Pacific College on February 11th. Thirty-three members were present. Earl Gunther was chairman of the day and demonstrated his ability to put over a real program. Dr. Frank Kirby,

educational director of The Abbott Laboratories, discussed different ways and means to stimulate professional pharmacy.

Dr. E. E. Chase, city veterinarian, gave an instructive talk on rabies. He discussed at length the prevention and control, as well as giving an accurate account of the present rabies epidemic.

HARVEY J. DONNELL, *Secretary.*

MARCH.

A regular meeting of the North Pacific Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION was called to order in the library of the North Pacific College at 8:00 P.M. by President F. A. Geue.

The minutes of the last meeting were read and approved.

Mr. Nau read letters from President P. H. Costello, of the AMERICAN PHARMACEUTICAL ASSOCIATION; Dean Ernest Little of Rutgers College of Pharmacy. All of these letters concerned the problem of membership in the AMERICAN PHARMACEUTICAL ASSOCIATION. A general discussion of these letters followed.

A Junior Membership in the AMERICAN PHARMACEUTICAL ASSOCIATION for pharmacy students was brought up and discussed, this membership to apply to those regularly enrolled in pharmacy as college students.

The membership committee reported work and plans for increased membership and will give a more detailed plan and program at the next meeting.

President Geue discussed programs for the regular meetings in April and May. Unless otherwise notified, the April meeting is to be in charge of the Committee on Professional Interests, Walter Rhodes, *Chairman*, and will be held on April 7, 1936, to accommodate the speaker of the evening. The May meeting will be in charge of the Committee on the Scientific Section, E. A. Kelly, *Chairman*.

A tentative program for the North Pacific Branch to be given at the annual meeting of the Oregon State Pharmaceutical Association was outlined, A. O. Mickelsen and Frederick Grill to talk on the application of mineral oil in pharmacy and changes in the U. S. P. and N. F., respectively.

HARVEY J. DONNELL, *Secretary.*

NORTHWEST.

The Northwest Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION in conjunction with the Scientific and Practical Section of the Minnesota State Pharmaceutical Association held two meetings at which a total of 16 papers, 13 committee reports and 2 addresses were given.

WEDNESDAY, FEBRUARY 12TH, CURTIS HOTEL, MINNEAPOLIS.

Chairman's Address, Dean F. J. Wulling.

REPORTS.

1. Committee on Adulterations, Rugnar Almin.
2. Committee on the College of Pharmacy, James B. Dargavel.
3. Committee on National Pharmacy Week, Frank M. McCabe.
4. Committee on Practical Pharmacy, F. A. U. Smith.
5. Committee on Public Health, George T. Kermott.
6. Committee on Research, Chas. V. Netz.
7. Committee on U. S. P. and N. F. Revision, Gustav Bachman.
8. Committee on Drug Plant Culture, Earl B. Fischer.
9. Committee on Education, Oscar Nordrum.
10. Committee on the M. S. Ph. A. Fellowship, Charles T. Heller.
11. Committee on Hospital Pharmacists, Miss Hallie Bruce.
12. Historical Committee, Dean F. J. Wulling.
13. Committee on Professional Standards, Jesse B. Slocumb.

PAPERS.

1. "Some Poisonous Plants," Gustave J. DeMars.
2. "College of Pharmacy, University of Minnesota," Historical—1934–1935, Dean F. J. Wulling.

3. "U. S. P. XI Test for Ergot," F. A. U. Smith.
4. "The Mechanism and Treatment of Poisoning by Mercury Cyanide and Carbon Monoxide," Edward A. Brecht.
5. "The Selection of Students for the Study of Pharmacy," Carl R. Douglass and Dean F. J. Wulling.
6. "Improve the Prescription Practice," Jos. Vadheim.
7. "Our Professional Attitude," H. O. Teigen.
8. "A Study of the Mechanism of the Reaction of Mayer's Reagent for Alkaloids," Gerald Fostvedt.

THURSDAY, FEBRUARY 13TH, CURTIS HOTEL, MINNEAPOLIS.

9. "A brief Report on the Progress of Aconite Research," Edward A. Brecht, co-holder of M. S. Ph. A. Fellowship.
10. "Hospital Pharmacy," Sister St. George.
11. "A Comment upon the Knudson-Dresback Colorimetric Assay for Digitalis," Earl B. Fischer.
12. "The Relationship of the Chemical Constitution of Morphine to Its Therapeutic Action (Illustrated)," Chas. V. Netz.
13. "The Determination of Bile Salts in Proprietary Preparations," Chas. H. Rogers.
14. "Modern Alchemy," George E. Crossen.
15. "The Chemical Constitution of Plant and Insect Waxes (Illustrated)," Ole Gisvold.
16. "Water N. F. VI," Karl Goldner.

Address: John W. Dargavel, Executive Secretary of the N. A. R. D.

Address: Lotus D. Coffman, President of the University of Minnesota.

Dean F. J. Wulling presided and was assisted by Rugnar Almin, chairman of the Northwest Branch.

All reports, papers and addresses will be printed in full in the "Proceedings of the Minnesota State Pharmaceutical Association for 1936."

CHAS. V. NETZ, *Secretary*.

ST. JOHN'S UNIVERSITY.

The third meeting of St. John's University Branch, A. PH. A., was held March 9, 1936, Mr. Asnis presiding. The minutes of the previous meeting were read and approved. Prof. J. J. Corcoran introduced Dr. Reiser as the first speaker of the evening.

Dr. Reiser discussed the training necessary in Germany before a degree is conferred. He emphasized that a student must be in love with his work. He gave experiences from his own life in the course of his remarks. Professor Corcoran introduced Dr. Blass as the next speaker of the evening. The speaker stated that although Pharmacy was not a flaming torch for his later career, it certainly was not a hindrance. He said that the pharmacist should coöperate with the dentist to make him a better practitioner; he referred to prescription writing as a means to lessen self-medication. The pharmacist should make medicines palatable; if anything appears doubtful on the prescription, the pharmacist should consult the prescriber. The pharmacist should encourage the prescribing of U. S. P. and N. F. preparations. Dr. Blass then presented to the group several pictures of diseases of the mouth and how self-medication frequently aids in destroying tissues of the mouth and increases susceptibility to germs. The speakers were given a vote of thanks.

ISABELLE SEISMANN, *Secretary*.

STUDENT BRANCH OF PHARMACY.

The first meeting of the Louisville College of Pharmacy Student Branch of the AMERICAY PHARMACEUTICAL ASSOCIATION was called to order on February 11, 1936, by Dean G. L. Curry who presided until after the following officers were duly elected:

President, William J. Walsh; *Vice-President*, Fred P. Kranz, Jr.; *Secretary*, Joe Black; *Treasurer*, John M. Burton; Dean G. L. Curry, Faculty Adviser.

After the installation of officers, Dean Curry retired and President Walsh took the chair.

The following standing committees were named by President Walsh:

Program Committee: *Chairman*, Horace Hannon; Sister Crescentia Wise; Henry J. Zurlage.

Student Activities Committee: *Chairman*, Claude M. Lloyd; Sister Margaret Ann Schwering, Edward E. Krebs.

Membership Committee: *Chairman*, Fred P. Kranz, Jr.; Hal F. Acuff, Joe P. Forgy, Jr.

FEBRUARY 19, 1936.

The second meeting of the Student Branch of the A. PH. A. was called to order on February 19th, with President Walsh presiding.

In order that the students may become acquainted, the president introduced each member.

The secretary read a letter of February 17th from Secretary E. F. Kelly, A. PH. A., to Dean Curry acknowledging the receipt of the application of this Branch.

Chairman Horace E. Hannon, of the Program Committee, announced that Mr. Arthur P. Markendorf, member of the Kentucky Board of Pharmacy, would be the speaker for the next meeting.

A motion was made by Sister Anne, seconded by Sister Crescentia, that the meetings be held on the first Wednesday of each month. Motion carried unanimously.

The roll call followed, all members present except James R. Burgess.

MARCH 4, 1936.

The third meeting of the student branch, Louisville College of Pharmacy, was called to order by President Wm. J. Walsh. Minutes of the previous meeting were read and approved.

Dean Curry introduced Arthur P. Markendorf, member of the Kentucky Board of Pharmacy, who gave a most interesting address on "The Ethics of Pharmacy."

A letter under date of March 2nd from Secretary E. F. Kelly was read, notifying the approval of this branch by the Council of the AMERICAN PHARMACEUTICAL ASSOCIATION.

Reports from committees as follows:

There were no reports from the Student Activities and the Membership Committees.

Chairman Horace Hannon of the Program Committee announced that the program for the April meeting would consist of a talk on "Phenol" by Fred P. Kranz, Jr., and also a talk on "Official Remedies for Burns" by Claude M. Lloyd.

Motion was made by Horace E. Hannon that all members of the A. PH. A. in Louisville be notified of the organization of the Student Branch in the Louisville College of Pharmacy and invited to attend all future meetings. The motion was unanimously carried.

All members were present.

JOE BLACK, *Secretary.*

TENNESSEE PHARMACY STUDENTS.

State Teachers' College, in keeping with authority recently granted by the Tennessee Board of Education, will coöperate in future with the University of Tennessee in providing a partial liberal arts course for pharmaceutical students entering the university with only a high school education. This order was subject to approval by the Board of Trustees.

Under the plan, pharmaceutical students would not be required to have two years of college training before entering the School of Pharmacy, but would receive the necessary prerequisite schooling at the University.

NATIONAL FIRST AID WEEK.

Dates have been set for the National First Aid Week, May 17th–23rd. This announcement has been given by the National Association of Retail Druggists. They state that this change has been made so as to avoid conflict with Mothers Day on May 10th.

ASSOCIATION BUSINESS

AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION 1935–1936.

Office of the Secretary, 2215 Constitution Avenue, Washington, D. C.

LETTER NO. 16.

March 18, 1936.

To the Members of the Council:

102. Use of Text of N. F. VI. Motion No. 44 (Council Letter No. 14, page 260) has been carried and Drs. Jenkins and DuMez have been so advised.

The following letter has been received from Chairman DuMez of the Committee on Publications to which Committee the requests were referred:

> "I have a majority of votes in favor of granting permission to Professor Cook to use portions of the text of the N. F. in a new edition of 'Remington's Practice of Pharmacy' for a fee of $750.00. I therefore recommend to the Council of the A. PH. A. that this be done.
>
> "I also have a majority of votes in favor of granting permission to Dr. H. C. Wood, Jr., to use portions of the text of the N. F. in a new edition of the 'U. S. Dispensatory' for a fee of $500.00. I therefore recommend to the Council that permission be granted and that a fee of $500.00 be charged for it.
>
> "In addition to the foregoing, I have received a majority of votes in favor of granting permission to Dr. H. V. Arny to use portions of the text of the N. F. in a new edition of 'Arny's Practice of Pharmacy.' I therefore recommend to the Council that permission be granted and that the fee be the same as that charged last time. Dr. Arny states that the material will be used in the same way as it was used in the present edition of 'Arny's Practice of Pharmacy.' "

(*Motion No. 48*) It is moved by DuMez that permission to use portions of the text of N. F. VI be granted to Prof. E. Fullerton Cook in a new edition of 'Remington's Practice of Pharmacy' at a charge of $750.00; to Dr. H. C. Wood, Jr., in a new edition of the 'U. S. Dispensatory' at a charge of $500.00; and to Dr. H. V. Arny in a new edition of 'Arny's Practice of Pharmacy' at a charge of $5.00, with the understanding that in each case the usual acknowledgment be made.

A vote on this motion is called for at this time as those making the requests desire an answer as promptly as possible. The vote will be considered as tentative if there is objection, or if further information is desired, or if comments are submitted.

103. Committee on Finance. Motion No. 45 (Council Letter No. 14, page 261) has been carried and Chairman Hilton is authorized to act as Temporary Chairman of this Committee in the absence of Chairman Philip who is much improved and who plans to go to California later for an extended rest.

104. Election of Members. Motion No. 46 (Council Letter No. 14, page 261) has been carried and applicants for membership numbered 235 to 248, inclusive, are declared elected.

105. Local Secretary, Time and Headquarters for the 1936 Meeting. No comments have been received and a vote is called for on Motion No. 47 (Council Letter No. 15, page 262).

106. Applicants for Membership. The following applications properly endorsed and accompanied by the first year's dues have been received:

No. 249, Frank Albert McArthur, 1006 Gerald Ave., Missoula, Mont.; No. 250, Jake Baker, Manhattan, Mont.; No. 251, Lloyd Wm. Kemmish, Conrad, Mont.; No. 252, James W. Vicars, 210 So. Third St., Livingston, Mont.; No. 253, Harold Rosenblum, 463 E. 178th St., New York, N. Y.; No. 254, Walter Franklyn Riker, Jr., 109 Central Ave., Hasbrouck Hts., N. J.; No. 255, R. L. Whaley, 136 E. Fifth St., Wahoo, Nebr.; No. 256, Alfred E. A. Hudson, 1103 Evergreen Ave., Goldsboro, N. Car.

(*Motion No. 49*) Vote on applications for membership in the AMERICAN PHARMACEUTICAL ASSOCIATION.

E. F. KELLY, *Secretary.*

LETTER NO. 17.

March 24, 1936.

To the Members of the Council:

107. Use of Text of N. F. VI. Motion No. 48 (Council Letter No. 16 (preceding)) has been carried and Doctors Cook, Wood and Arny have been so advised.

108. Local Secretary, Time and Headquarters for the 1936 Meeting. Motion No. 47 (Council Letters No. 15, page 261; and No. 16 (preceding)) has been carried. Walter D. Adams is the *Local Secretary*, the week of August 24th–29th is the Time, and the Hotel Adolphus is the Headquarters for this meeting.

109. Election of Members. Motion No. 49 (Council Letter No. 16 (preceding)) has been carried and applicants numbered 249 to 256, inclusive, are declared elected.

110. Report of the Auditor. The following report of the audit of the accounts of the ASSOCIATION for 1935 has been submitted:

March 20, 1936.

MR. C. W. HOLTON, *Treasurer,*
AMERICAN PHARMACEUTICAL ASSOCIATION,
Washington, D. C.

Dear Sir:

I have made an examination of the books and accounts of the AMERICAN PHARMACEUTICAL ASSOCIATION and of your report, as Treasurer, for the calendar year 1935, and I hereby certify that the total cash and securities on hand at December 31, 1935, amounting to $174,165.06, is correctly stated.

All cash receipts have been traced to deposits in banks to the credit of the respective funds for which received, and all disbursements have been found evidenced by properly authorized voucher checks.

Sales of Liberty Bonds and the redemption of Liberty Bonds called for payment have been verified by statements received from brokers, and the proceeds of these sales and redemptions have all been accounted for by deposits in the bank accounts of the ASSOCIATION or by reinvestment in United States Treasury Bonds.

Balances on deposit with the various banks have been reconciled with statements or certificates from the various depositories. Investment Securities, having a face or par value of $138,100.00, have been verified by an examination of the Certificates.

Interest accruing on registered bonds and coupons attached to other bonds have been properly accounted for on your report and verified by an examination of bank deposits.

Records maintained by the Secretary of the ASSOCIATION have been examined and transfers of funds from his account to that of the Treasurer have been verified and found to be correctly stated.

Respectfully submitted,
W. A. JOHNSON, *Certified Public Accountant.*

111. Corrections in N. F. VI. Chairman Gathercoal of the Committee on National Formulary writes:

"We are sending you under separate cover five pink pages designed for taking a vote from the A. PH. A. Council members on the proposed corrections for the second printing of N. F. VI and for an interim revision.

"The vote on the first 22 items has been completed in the N. F. Committee and the proposed changes have been approved. The vote on the second group of items is now going forward in the N. F. Committee, but I presume that it will be one of approval."

The two pages of the N. F. Bulletin giving Items 1 to 22, inclusive, are attached and the second group of proposed corrections will be submitted to the Council as soon as the Committee on N. F. has acted on them.

(*Motion No. 50*) It is moved by Kelly that the proposed corrections, Items 1 to 22, inclusive, in the text of the N. F. VI be approved, that corresponding corrections be made in the plates before the second printing of the N. F. VI, and that a correction sheet be issued covering the first printing.

112. Applicants for Membership. The following applications, properly endorsed and accompanied with the first year's dues, have been received:

No. 257, Joseph Samuel Arceri, 465 E. St. James, San Jose, Calif.; No. 258, J. H. Bader, 4348 Pearl Rd., Cleveland, Ohio; No. 259, L. D. Bachellor, 401 Clarendon Ave., N. W., Canton, Ohio.

(*Motion No. 51*) Vote on applications for membership in the AMERICAN PHARMACEUTICAL ASSOCIATION.

E. F. KELLY, *Secretary.*

LETTER NO. 18.

April 3, 1936.

To the Members of the Council:

113. Corrections in N. F. VI. Motion No. 50 (Council Letter No. 17, preceding) has been carried and Chairman Gathercoal has been so advised.

114. Election of Members. Motion No. 51 (Council Letter No. 17, preceding) has been carried and applicants for membership numbered 257 to 259, inclusive, are declared elected.

115. Use of Text of N. F. VI. The following communication has been received from Chairman DuMez of the Committee on Publications:

> "It is recommended that Dr. J. R. Blaney be granted permission to use portions of the text of the N. F. VI in the second edition of his textbook on 'Dental Pharmacology and Therapeutics' under the same conditions as that granted him in the Fall of 1931."

(*Motion No. 52*) It is moved by DuMez that Dr. J. R. Blaney be given permission to partially reproduce the text of N. F. VI in the second edition of "Dental Pharmacology and Therapeutics" under the usual conditions and at the usual charge of $5.00.

116. University of Mississippi Student Branch. The following applications have been received together with the applications for membership and the dues for 1936:

"We, students of University of Mississippi School of Pharmacy, desiring to establish a Student Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION, petition the Council of the ASSOCIATION to approve the formation of a Branch and By-Laws as submitted herewith.

Names appended:

Cecil Louie Allred	Charles Neill Eley	William Jacob Hossley
Hinds Blackwell	Ben Fink	George Cowen Kealhofer
James Benjamin Caver	George Currie Furr	Ephraim Peyton Jones
Joseph William Duckworth	Wilson Archibald Grice	John Middleton Longmire
Louis Audler Eaton	Orville Carr Grigsby, Jr.	Toxey Howard McBryde"
Johnson Lee Turnage	John Edward Ward	

Officers.—*President*, J. B. Caver; *Vice-President*, Toxey H. McBryde; *Secretary*, J. M. Longmire; and *Treasurer*, W. J. Hossley. *Faculty Adviser*, Dean E. L. Hammond.

CONSTITUTION OF THE UNIVERSITY OF MISSISSIPPI STUDENT BRANCH.

Preamble.—We, the students of the University of Mississippi, in order to place ourselves in a more favorable position for study, acquire a better knowledge of our professional problems, for the purpose and privilege of sharing in the undertakings and interests of the AMERICAN PHARMACEUTICAL ASSOCIATION, do constitute ourselves into a Student Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION and adopt this Constitution and By-Laws.

ARTICLE I. *Name.* The name of this organization shall be the University of Mississippi Student Branch of the AMERICAN PHARMACEUTICAL ASSOCIATION.

ARTICLE II. *Membership.* The members of the Branch shall be elected from among the

bona fide students of the School of Pharmacy of the University of Mississippi who shall have met the requirements for associate membership in the AMERICAN PHARMACEUTICAL ASSOCIATION.

ARTICLE III. *Officers.* The officers of this Branch shall be: (*a*) A president; (*b*) A vice-president; (*a*) A secretary; and (*d*) A treasurer.

ARTICLE IV. *Committees.* At the first January meeting of each fiscal year or as soon thereafter as possible, the president shall appoint three standing committees as follows: A Committee on Program to consist of three members; a Committee on Student Activities, to consist of three members; and a Committee on Membership to consist of three members.

ARTICLE V. *Meetings.* The meetings of the Branch shall be held at least once a month and as many more times as might seem advisable from the opening date of school each year to the close. . Date of the meeting to be selected by the officers of the Branch.

ARTICLE VI. *Quorum.* One-half of the number of members of this Branch who are in regular attendance at the University during the period in which a meeting is held shall constitute a quorum.

ARTICLE VII. *Fiscal Year.* The fiscal year of the Branch shall be from the first of January until the first day of January of the following year.

ARTICLE VIII. *Elections.* The officers shall be elected by ballot by a majority, at the last meeting held in December and shall be installed at the first meeting held in January, and shall serve for one year or until their successors have been elected.

ARTICLE IX. *Presiding Officers.* In the absence of the president, the next succeeding officer shall take the chair.

ARTICLE X. *Secretary.* The secretary shall keep fair and correct the minutes of the proceedings of the meetings and send reports of the same to the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION as often as is required, and to such journals and newspapers as he may deem proper. He shall preserve on file, all reports and papers of every description presented to the Branch, and shall be charged with the necessary business and scientific correspondence. He shall read all papers handed to him by the president for the purpose, shall notify the chairman of every standing and special committee of his appointment, giving him a list of his colleagues and stating the business upon which the committee is to act. He shall notify every member at least one week in advance of the time and place of the meeting.

ARTICLE XI. *Treasurer.* The treasurer shall collect and take charge of the funds of the Branch and shall give receipts for the same. He shall pay no money except upon order of the secretary countersigned by the president and accompanied by the proper vouchers. He shall present a statement of conditions at each December meeting of the Branch. He shall receive the amount of his expenses incident to the duties of his office.

ARTICLE XII. *Order of Business.* (1) Reading of the minutes of the previous stated meeting; (2) Introduction of newly elected members; (3) Unfinished or deferred business; (4) New Business; (5) Program; (6) Nominations and elections; (7) Adjournment.

ARTICLE XIII. *Amendments.* Section 1. The constitution shall be amended only upon vote of three-fourths of the members of this Branch who are in regular attendance at the University at the time the proposed amendment shall be submitted.

Section 2. This constitution shall be amended in no way that shall conflict with the policy of the AMERICAN PHARMACEUTICAL ASSOCIATION toward Student Branches.

(*Motion No. 53*) It is moved by Kelly that the application to establish a Student Branch in the School of Pharmacy, University of Mississippi, and the proposed Constitution of the Branch be approved.

117. D. C. Unemployment Compensation Act. The following information has been submitted by the D. C. Unemployment Compensation Board:

"The National Social Security Act (Section 901) imposes upon every employer of eight or more persons in the United States a tax of 1 per cent on his payroll in 1936, 2 per cent in 1937, and 3 per cent in 1938, but provides that each such employer may credit against that tax any contributions paid by him under the District of Columbia (or any State) law for unemployment compensation; provided that this credit may not exceed 90 per cent of the Federal Tax (Section 902 of the Act).

"The District of Columbia Unemployment Compensation Act imposes upon every employer of one or more persons in the District of Columbia a tax of 1 per cent on his payroll in 1936, 2 per

cent in 1937, and 3 per cent in 1938 (Section 3 (*a*) of the Act). This Act applies to every employer of persons performing the greater part of their service in the District, with a few exceptions noted in the Act and these Regulations. As to employers of eight or more persons, the increased tax burden under this Act is slight. Such employers are already liable to the United States for taxes of 1, 2 and 3 per cent for 1936, 1937 and 1938; the question for them under the District law is merely one of securing credits against that Federal tax. As to employers of seven persons or less, the District law alone applies (Section 3 (*a*) of the Act).*****

"Religious, charitable, educational, scientific and other similar organizations frequently exempt from taxing statutes are employers under this statute and subject to all its provisions."

and after the matter was investigated with the assistance of Chairman Hilton, it was accepted as necessary to pay the tax.

However, as the constitutionality of the measure is likely to be questioned, the checks in payment of the tax have borne the notation "Paid Under Protest" so that recovery can be had if the measure should not be upheld.

The tax which amounts for the current year to between $12.00 and $13.00 per month is being charged to Item 2 (Maintenance) of the budget and if required, a corresponding addition to the budget will be requested later.

118. Applicants for Membership. The following applications, properly endorsed and accompanied with the first year's dues, have been received:

No. 260, Cecil Louie Allred, Jr., P. O. Box 631, University, Miss.; No. 261, Hinds Blackwell, Box 183, University, Miss.; No. 262, James Benjamin Caver, Box 465, University, Miss.; No. 263, Joseph William Duckworth, Box 535, University, Miss.; No. 264, Louis Audler Eaton, Box 156, University, Miss.; No. 265, Charles Neill Eley, Box 547, University, Miss.; No. 266, Ben Fink, P. O. Box 273, University, Miss.; No. 267, George Currie Furr, Route L, Box 187, Oxford, Miss.; No. 268, Wilson Archibald Grice, 412 South Fifth St., Oxford, Miss.; No. 269, Orville Carr Grigsby, Jr., 413 S. Fifth St., Oxford, Miss.; No. 270, William J. Hossley, Jr., P. O. Box 123, University, Miss.; No. 271, George Couren Kealhofer, University, Miss.; No. 272, Ephraim Peyton Jones, Box 599, University, Miss.; No. 273, John Middleton Longmire, P. O. Box 461, University, Miss.; No. 274, Toxey Howard McBryde, P. O. Box 156, University, Miss.; No. 275, Johnson Lee Turnage, Box 163, University, Miss.; No. 276, John Edward Ward, Box 154, Darling, Miss.; No. 277, Earl N. Manchester, Library, Ohio State University, Columbus, Ohio; No. 278, Joseph Lachs, 199 Keap St., Brooklyn, N. Y.; No. 279, Earl B. Fischer, 4921 Fremont Ave., So., Minneapolis, Minn.; No. 280, James Francis Malone, 24 Washington Blvd., Oak Park, Ill.; No. 281, Eli H. Keshishian, 438 Winthrop, West Medford, Mass.; No. 282, Jerome Boonshoft, 3165 E. Tremont Ave., Bronx, N. Y. C.; No. 283, Charles B. McDermott, 180 N. Michigan Ave., Suite 1706, Chicago, Ill.; No. 284, Clarence Harper Cobb, c/o Duke Hospital, Durham, N. C.; No. 285, Knute M. Nelson, 421 N. 22nd St., LaCrosse, Wis.

(*Motion No. 54*) Vote on applications for membership in the AMERICAN PHARMACEUTICAL ASSOCIATION.

E. F. KELLY, *Secretary.*

PHARMACEU TIAL SOCIETIES OF MEXICO.

Sociedad Farmaceutica Mexicana.—*President,* Prof. Amador E. Ugalde, Alvaro Obregon 25, Mexico, D. F.; *Vice-President,* Prof. T. Bezanilla Testa, 16 de Septiembre 13, D. F.; *Treasurer,* Prof. Ignacio Lopez Valdes, Republica del Salvador 178, D. F.; *Secretary,* Prof. Carlos Patino, Pino, Suarez 56, Mexico, D. F.

Union de Quimicos y Farmaceuticos.—*General Secretary,* Manuel Vazquez Vega, Union de Quimicos y Farmaceuticos, Avenida Hidalog, 5, Mexico, D. F.; **Secretary of the Interior,** T. Bezanilla Testa; **Secretary of the Exterior,** Humberto Farrera; *First Recording Secretary,* Joaquin Matienzo; *Second Recording Secretary,* Enrique Ochoa Cortes; *Secretary-Treasurer,* Leopoldo Blasquez; *Assistant Treasurer,* Theodomiro J. Angeles; **Press and Publicity,** Simon Jose Auais.

REPORT OF THE PHARMACY WEEK EXECUTIVE COMMITTEE.

The Federal Wholesale Druggists' Association Robert J. Ruth Memorial Trophy consisting of the beautiful silver loving cup, as donated by the Federal Wholesale Druggists' Association, will be presented to Nathan Fried, 1024 West 63rd Street, Chicago, Illinois, as soon as proper arrangements can be made for the presentation. Ten merit certificates, as donated jointly by the AMERICAN PHARMACEUTICAL ASSOCIATION and the National Association of Retail Druggists, will be sent to those pharmacists in connection with the ten merit certificate awards as set forth in the report.

A study of the photographs, as submitted in the 1935 National Pharmacy Week Window Display Contest, clearly reveals that pharmacists are devoting considerable time and attention to professional displays for the photographs are of an especially high character, all of which is indicative of the fact that more time and attention is deing devoted to the subject of professional pharmacy.

Pharmacy Week Executive Committee.

A. PH. A. Committee.

Anton Hogstad, Jr., *Chairman*
John O'Brien
L. M. Kantner
E. J. Ireland
Edward Spease
John H. Hoagland
Roy S. Warnack

N. A. R. D. Committee.

A. V. Burdine, *Chairman*
James P. Crowley
J. J. Gillespie
Wm. B. Zubrod
Clare F. Allen
Benjamin Cohen
Joseph H. Rosenthal
Fred G. Kustermann
Roy S. Perry
Ambrose Hunsburger.

The Committee of Awards concludes its report (page 352) in the following:

Your Committee has greatly enjoyed its work and its only regret is that recognition could not be given many others of the attractive and well-designed displays.

Pharmacists everywhere have shown a fine interest in the forwarding of their profession through Pharmacy Week and we are confident that future years are to show a still greater development.

Signed: CHARLES F. HENKE, JR., *Chairman*; OTTO E. KISTNER; J. OTTO KOHL; O. C. REIFSCHNEIDER; BERNARD J. KOTTE.

PHILADELPHIA HOLDS ANNUAL EXHIBITS.

The general public had an opportunity to see a scientific institution in actual operation, when, on Friday and Saturday, April 17th and 18th, the Philadelphia College of Pharmacy and Science held its annual Science Day exhibits. The purpose of the exhibition is to show the variety of apparatus and equipment which the College uses every day for class-room instruction and in the numerous research projects in operation. All of the institution's laboratories were open for inspection, with the faculty and a selected group of students on hand to demonstrate the various pieces of equipment and explain their operation.

OFFICERS OF THE BALTIMORE BRANCH, A. PH. A.

President, A. N. Hewing; *Vice-President*, Charles S. Austin; *Secretary-Treasurer*, Robert S. Fuqua; *Membership Committee*, Gilbert Joseph; *Professional Relations Committee*, Marvin J. Andrews, *chairman;* John J. Kairis, T. G. Wright, A. J. Zolenas, Aquilla Jackson, Carlton E. Wich; *Science and Practice of Pharmacy*, Samuel L. Fox, *chairman;* M. B. Wagner, Harry S. Harrison, Wm. A. Purdum, Earl Norris; *Education and Legislation*, Dean A. DuMez, *chairman;* R. L. Swain, Simon Solomon, George Bowman, George Rezek.

RESEARCH WORK BEING DONE ON NATIONAL FORMULARY PROBLEMS.

1. Study of the N. F. VI Ampul and Tablet Monographs.—The Council of the AMERICAN PHARMACEUTICAL ASSOCIATION has approved the recommendation of the A. PH. A. Research Committee that $1500.00 for the year 1936 be granted from the Research Fund for this study under the general direction of Chairman Gathercoal.

An Advisory Committee of five men from manufacturing houses, who are familiar with tablet manufacture and with chemical analysis, is to plan investigative work in considerable detail, is to assist in procuring materials and will undertake collaborative studies where desirable. The following men have consented to serve on the Advisory Committee which will meet several times during the year:

F. E. Bibbins, Eli Lilly & Co.
E. B. Carter, Abbott Laboratories
J. B. Fullerton, The Upjohn Co.
C. C. Neal, Sharp & Dohme
F. O. Taylor, Parke, Davis & Co.

The detailed analytical work is to be done by Mr. R. K. Snyder, B.S., M.S. (in Pharmacy), at the School of Pharmacy, University of Illinois.

2. A Study of the N. F. VI Section on Materials and Preparations for Diagnostic Use.—Dr. Russell A. Cain and Dr. H. A. Langenhan, College of Pharmacy, University of Washington, with an advisory committee consisting of the directors of clinical laboratories in a number of the hospitals and medical schools, and some of the authors of textbooks on diagnostic methods, will make this study.

It is proposed that the study shall determine: (*a*) What items should be deleted; (*b*) What items should be added because of present-day usage; (*c*) What changes should be made in the present formulas; (*d*) Satisfactory formulas for new items to be added. The expense of this investigation which will probably require two years is limited to the cost of the necessary materials.

3. Study of the Pepsin Elixirs and Other Problems under the Direction of Chairman Gathercoal.—Mr. Sidney Taylor has been engaged as research assistant and an appropriation of $800.00 has been made for this work. It is proposed to determine the pepsin deterioration and the best means of preventing this, including the p_H of each ingredient and the effects of buffer solutions.

4. A Study of the Tests for Identity and Purity of the Organic Chemicals of N. F. VI.—By Dr. Louis Fischer, Fred Johnson, Dr. E. A. Kelly and Dr. H. A. Langenhan. It will include: (*a*) Checking present official tests against authentic pure samples; (*b*) Checking the present tests on a series of possibly ten different samples of each item from as many different manufacturers or stores, to determine how the commercial articles compare with the pure specimens; (*c*) Studying the monographs for missing data, such as melting point, optical activity, reaction to litmus, readily carbonizable substances, permanence in air, solubilities, etc.; develop this data; (*d*) Studying the literature for valuable additional data, such as the amount of water of crystallization, the stability of the water of crystallization, the development of replacement titration methods, etc. The expense will be limited to the cost of supplies. It is planned to develop an advisory committee of chemists from several pharmaceutical chemical manufacturing houses. Dr. Joseph Rosin and Dr. Lynn A. Watt have offered to serve on this committee, and others will be invited.

5. Study of Vehicles for Mucous Membrane Medication.—By Miss Hattie Dyniewicz and Dr. Bernard Fantus. While ointments and pastes for skin medication have been quite extensively studied, very little attention has been given to vehicles for mucous membrane medication. It is proposed to study emulsions (solid or pasty) of both the oil-in-water type and water-in-oil type with the medicament contained in each phase of each type, including further work on "Hydrophile Petrolatum" or water-absorbing petrolatum. An appropriation of $500.00 for 1936 has been made to carry it on.

6. Study of the Volatile Oil Content of Crude Drugs, by Mr. Ray Adamson and Dr. E. H. Wirth, will embrace a comparison of the several methods for determining volatile oils in crude drugs. The volatile ether-soluble residue, extraction methods with other solvents, and the several distillation methods will be compared. It is expected that several of our present crude drug monographs will be improved by the standards and methods developed.

7. Study of Oral Antiseptics and the Test for Antiseptic Value as Found in the Monograph on Liquor Antisepticus, N. F. VI, by E. E. Vicher, Esther Meyer and E. N. Gathercoal, is especially concerned in the improvement of the test for antiseptic value, and of the formula for this product.

8. Study of the Water Content of N. F. Chemicals, by Dr. Glenn L. Jenkins and a graduate student, School of Pharmacy, University of Maryland, is to check the present figures on high grade samples of these chemicals and on commercial samples from drug stores in various parts of the United States. An effort will be made also to provide proper water content figures for those monographs in which this data is now missing. This information will have an important bearing on the storage of chemicals in pharmacies.

9. Study of the Solubilities of N. F. Chemicals, by Dr. Glenn L. Jenkins and a graduate student, is designed to check the present solubility figures and to add additional figures where desirable, making the data more valuable to those interested in solubilities.

10. Study of Colloidal Kaolin, by Dr. Glenn L. Jenkins and a graduate student, is designed to prepare a suitable monograph for this important medicinal item.

11. Study of the Assay of Neocinchophen Tablets, by Dr. Glenn L. Jenkins and a graduate student. Tablets of Neocinchophen were admitted to N. F. VI, but the monograph could not be included because of the inability to provide a suitable assay method before publication.

12. Study of the Monographs of the Glandular Products.—Dr. M. S. Dunn and Mr. Paul Mattis, Philadelphia College of Pharmacy and Science, have worked extensively on the histologic description of the glandular monographs as prepared by Dr. Youngken, and find them to be substantially correct. They have also experimented extensively with tests for identification. It is expected that a meeting of the N. F. Committee on Glandular Products will soon be called to consider further studies of assays and standards of strength for these products.

13. Study of the Naming of Colors as Employed in the U. S. P. and N. F., by Dr. I. H. Godlove, Dr. Deane Judd, Mr. M. Rea Paul and others. Dr. Godlove presented his first report on this subject before the Inter-Society Color Council some two years ago, and since then has added a number of marked improvements to this report. His work provides a means of naming colors by the use of simple English words (note more than three per color name), yet these names are based upon a strictly scientific foundation and can be accurately transposed into terms of the trichromatic color scale, or ranges of Angstrom units, or into the Munsell system of color designation. This report by Dr. Godlove has been highly commended by Dr. Judd and others in the Bureau of Standards, U. S. Department of Commerce. The U. S. P. and the N. F. will jointly provide a suitable pharmaceutical worker to make the detailed studies on U. S. P. and N. F. items, and the officials of the Bureau have offered to give the use of the necessary instruments and their help and advice in determining the proper names for these colors.

The annual expense for the two years probably required would hardly be less than $1200.00. Such a report would be of great value in the future revisions of the U. S. P. and the N. F. and to the practicing pharmacist.

14. Study of Adonis from the Pharmacognostical and Pharmacological Standpoints, by E. B. Fischer, University of Minnesota, College of Pharmacy. The expense will be limited to the cost of supplies.

15. Study of American Cannabis as Compared with Indian Cannabis from the Pharmacognostical-Pharmacological Standpoints.—By Paul D. Carpenter and Dr. E. H. Wirth. Probably no expense will be involved beyond the cost of supplies.

16. A Pharmacognostical Study of Sabal, by Dr. E. J. Ireland of the School of Pharmacy, University of Florida, who is very fortunately situated for obtaining supplies of the fresh fruit, and noting the manner of commercial collection and preparation of the fruit for market. In view of the controversy regarding the N. F. monograph, this study will be very timely and valuable.

17. A Study of Ephedrine Spray and Compound Ephedrine Spray, by Professor R. E. Terry of the University of Illinois, School of Pharmacy, is primarily to determine the cause of the development of ammoniacal and garlic-like odors in these preparations. Special attention will be given to the decomposition of ephedrine, the quality of and changes in the liquid petrolatum, the moisture content, and methods of preservation against light, air and heat.

EDITORIAL NOTES

AMERICAN MEDICAL ASSOCIATION.

The American Medical Association will meet in Kansas City, May 11th–15th. There will be in attendance a number of foreign visitors, among them Lord Horder of Ashford, of London, England; Dr. Afranio do Amaral of Institute Butantan, São Paulo, Brazil, and Dr. Francisco Miranda, Mexico City.

The American Medical Association arranges for exhibits during the convention and as in recent years there will be an exhibit of the U. S. P. products and of the National Formulary preparations. Pharmacists in Kansas City will find the exhibits educational and instructive, because of the information to be derived relative to the items used and prescribed by physicians.

The publications of the medical associations should be represented in the pharmacists' libraries, and the study coördinated with that of pharmaceutical literature. This permits a reference to the Abstract Section in each issue of the JOURNAL, for example see the March issue, aside from other parts, the pages 100 to the end of the Section. Development of the reading habit is a source of profit and education.

May we call attention to the article on "Pharmacologic Research," its principles and methods by Dr. Hans Molitor in *Merck's Report* for April.

VISITORS AT THE PAN-AMERICAN MEETING OF HEALTH OFFICERS.

Dr. B. J. Lloyd, Washington (with U. S. Public Health Service—Pan-American Sanitary Bureau); Dr. and Mrs. L. L. Williams, Jr., U. S. Public Health Service, Washington, D. C.; Justo F. Gonzalez, M.D., Montevideo, Uruguay (ministere, Public Health); Enrique Torres Herrera, M.D., Bogota, Colombia, S. A.; Emigdio Lola, Managua, Nicaragua, C. A. (minister of Hygiene and Benefuencia); Solon Nunez, San José, Costa Rica; Dr. A. A. Moll, Pan-American Sanitary Bureau; Enrique Lopez Herrarte, Legation of Guatemala, Washington, D. C. (diplomat); Gregoin Marquez, Pan-American Sanitary Bureau; Dr. W. E. Coutts, Santiago, Chile (physician); Arnoldo Gabaldon, M.D., Sc.D., Ministerio de Sanidad, Cafacas, Venezuela; Carlos Monge, M.D.

THE NEW MICROSCOPE "SCALES."

A "weight microscope," the first of its kind in the United States, was announced recently by the Dupont Co.'s science experimental station.

This centrifuge, designed by the Swedish scientist, Dr. The Svedburg, does for weight what a microscope does for size. But where the ordinary microscope multiplies size a few hundred or thousand diameters, this "microscope" multiplies actual weight a quarter of a million fold.

Size does not change. Thus, molecules or small bunches of atoms which can never be seen by a light microscope, become so enormously heavy that scientists can visualize the "parts" of which they are made and tell how they are put together.

DEATHS FROM CHOLERA IN SIAM.

Medical reports disclose that 1400 persons had died of cholera in Siam from the beginning of the outbreak in February to mid-April.

MYSTERY EPIDEMIC.

More than 120,000 persons in Milwaukee and suburbs have been attacked by a baffling intestinal malady that physicians of the city are still at a loss to explain. For lack of a better, or at least a more scientific name, the strange ailment has been called "intestinal flu." Dr. John P. Koehler, Health Commissioner of Milwaukee, believes that the malady is the same as that which has caused frequent epidemics for the last eighteen years.

NATIONAL BUREAU OF STANDARDS AND THE NATIONAL ACADEMY OF SCIENCES.

The 205th regular meeting of the American Physical Society will be held in Washington, D. C., at the National Bureau of Standards on Thursday and Friday, April 30 and May 1, 1936, and at the National Academy of Sciences, and at the AMERICAN PHARMACEUTICAL ASSOCIATION on Saturday, May 2, 1936. The first session will be at 9:30 o'clock on Thursday morning.

There will be sessions in the East Building, the Chemistry Building and the Industrial Building of the National Bureau of Standards, in the Auditorium and Lecture Hall of the National Academy of Sciences, and in the Au-

ditorium of the AMERICAN PHARMACEUTICAL ASSOCIATION.

TOUR OF GERMAN APOTHECARIES.

A party of German apothecaries visited the United States making stops in Chicago, Detroit, Niagara Falls, New York, Washington, Baltimore, Philadelphia, Boston and other points; the members will return to their homes early in May.

Sunday, April 26th, the members of the party visited the AMERICAN INSTITUTE OF PHARMACY after luncheon at the Mayflower. The following were present from Washington: Secretary E. F. Kelly, A. PH. A., who extended greeting; Chairman of the Council, S. L. Hilton; Charles J. Fuhrman, Howard University; and Editor E. G. Eberle, all of whom made brief remarks. J. French Simpson, president of the Veterans and of the D. C. Druggists' Association introduced the speakers and added to the words of welcome. President Kinast of Essen-Berlin, and other visitors responded. Mrs. Hilton and visiting ladies graced the table.

Arriving at the building brief addresses were made and the visitors were shown through the building; they gave expression to their appreciation and admiration for the building and its purpose.

Chairman Hilton made timely closing remarks for the AMERICAN PHARMACEUTICAL ASSOCIATION and Dr. F. Kinast, president of the German Apothecaries Association spoke for the visitors. The following were members of the party and hailed from more than twenty cities of Germany: Werner Mueller, Hans Strobel, Aloes Wimmer, F. Kinast, John Hermes, George Scheuing, Willy Bruennor, Mrs. Anna Schulte, Mr. and Mrs. Ruhnke, George Kernes, Paul Preuss, Mrs. Martha Preuss, Mr. and Mrs. Kuby, Ernest Erfurt, Gustav Buchheim, Wilhelm Mardner, Gustav Riedel, Herman Stadtmueller, Richard Reichel, Mr. and Mrs. Louis Mattheides, Rudolph Wittke, Friedrich Brunner, Mrs. Emma Vollbrecht, Arthur Bertram, Paul Skrzipietz, Hans Wagenknecht, Otto Bayer, Julius Mayer, Ernest Hennecke, Richard Klahr, Gero Lindau, H. Motte, Mr. Dehlholm and the interpreter, Mr. Palm.

CANNABIS HABIT SCHEDULED FOR DISCUSSION IN GENEVA.

Stuart J. Fuller, of the State Department, and Harry J. Anslinger, Commissioner of Narcotics, left Washington April 13th for Geneva to attend the semi-annual meeting of the Opium Advisory Committee of the League of Nations.

One of the matters expected to cause much discussion is the spread of addiction to cannabis, marijuana or Indian hemp. Use of this drug is said to be spreading in England. The American delegation probably will be called on for an explanation, and the reply will be that, while there is no Federal legislation on the subject, all but three states have laws against its use, and in all seaboard states mere possession of the drug is a prison offense. The committee may inaugurate studies of the real value of cannabis in medicine.

HEXAHYDROXYFERRIC CHLORIDE INJECTIONS RELEASE OXYGEN IN BLOOD, DETACH THE MONOXIDE.

To hasten the detachment of carbon monoxide from the hemoglobin in carbon monoxide poisoning, hexahydroxyferric chloride has been found useful in experiments with small experimental animals. A paper on this subject was presented before the Division of Medicinal Chemistry of the American Chemical Society, by Dr. Samuel Seifter and Dr. Joseph Seifter, of the University of Oklahoma School of Medicine.

Compounds of the type of hexahydroxyferric chloride are made by causing to react certain iron compounds with hydrogen peroxide. The resulting complexes readily release oxygen in such a form as to furnish adequate oxygen supplied to the tissues, while hastening at the same time the detachment of carbon monoxide from the hemoglobin.

The compound has been injected into rats poisoned with coal gas, or pure carbon monoxide, and 75 per cent of the animals thus treated recovered, while 33 per cent of controls receiving oxygen only recovered.

MASSACHUSETTS BOARD OF PHARMACY VISITS FLOOD AREA.

The New England State Pharmacy Boards have made a complete tour of the flood districts in New England. Secretary King, of the Massachusetts Board, says: "No one can quite realize the extent of damage done until he has actually seen it for himself. All of these stores had from one to two feet of water above their show cases. In these stores one could easily enter in a row boat."

PERSONAL AND NEWS ITEMS.

W. Bruce Philip, a former president of the AMERICAN PHARMACEUTICAL ASSOCIATION, member of the Council and active in many pharmaceutical affairs, has returned to California with Mrs. Philip. Mr. Philip has been in poor health for several months, but is improving slowly. The ASSOCIATION and his fellow pharmacists and members miss his valuable services, and his many friends hope the sea vogage will benefit this co-worker and wish for him early recovery; for both a very enjoyable visit and safe return.

BUFFALO PHARMACY ALUMNI CELEBRATED GOLDEN JUBILEE.

Dr. Willis G. Gregory, dean of the University of Buffalo School of Pharmacy since 1890, and now the oldest pharmacy dean in active service in the United States, was the guest of honor at the Golden Jubilee Banquet given by faculty members and alumni the evening of April 22nd. Besides honoring Dean Gregory, who joined the faculty in Pharmacy in 1886, the year of the founding of the School, the banquet will also celebrate the School's fiftieth anniversary.

The presentation of Dean Gregory's portrait was the special feature of the evening's program. The painting is the work of the nationally famous portrait painter, George Laurence Nelson. The principal speakers at the banquet were Dr. Robert P. Fischelis, former president of the AMERICAN PHARMACEUTICAL ASSOCIATION and Dr. Harlan H. Horner, Assistant Commissioner for Higher Education in the State of New York.

A sketch of Dean Gregory is the frontispiece of the April issue, 1935.

PROFESSOR CLYDE M. SNOW HONORED.

A testimonial dinner was given Prof. Clyde M. Snow on April 17th, at Lake Shore Athletic Club, Chicago. The honored guest retires from the faculty on account of age limit provisions. Dean William B. Day was chairman of the committee of arrangements. The banquet was largely attended and many letters and telegrams were received. Speakers gave expression to the services rendered and of the regard in which Professor Snow is held.

Dr. Frederick J. Wulling, founder and dean of the University of Minnesota College of Pharmacy, has announced that he will retire at the close of the school year, after a service of 44 years.

Following his graduation from the New York College of Pharmacy, Dr. Wulling served for a time on the faculty of the Brooklyn College of Pharmacy. In 1892, he was called to Minnesota University to establish a college of pharmacy.

World-wide fame has come to the extensive medicinal plant garden at the University which was planted and cultivated under his direction.

Dr. Wulling is a former president of the AMERICAN PHARMACEUTICAL ASSOCIATION and of the American Association of Colleges of Pharmacy.

Dean A. G. DuMez, of the School of Pharmacy of the University of Maryland, was elected vice-president of the Maryland Chapter of the American Association of College Professors at a meeting held at the University of Maryland, College Park, on March 30, 1936.

Marvin R. Thompson, Emerson Professor of Pharmacology of the School of Pharmacy, attended the annual meetings of The Federation of American Societies for Experimental Biology, March 25–28, 1936, at Washington, D. C., presenting a paper dealing with the comparative pharmacological syndromes of his recently discovered ergot alkaloid "Ergostetrine" and the ergotoxine-ergot-amine group of ergot alkaloids.

The President of the French Republic has been pleased to confer upon **Sir Henry Wellcome, LL.D., F.R.S.,** la Croix d'Officier de la Légion d'Honneur. This decoration is a further tribute to medical and chemical research to which **Sir Henry** has made many notable contributions.

Dr. James T. Jardine has been appointed director of research for the U. S. Department of Agriculture. Dr. Jardine has served as chief of the Office of Experiment Stations since 1931 and will continue in this capacity. His additional assignment becomes effective immediately.

As chief of the Office of Experiment Stations and director of research Dr. Jardine will be responsible for three major activities. He will continue in charge of the Office of Experiment Stations, which administers Federal grants to the states and territories for agricultural experiment stations, and coördinates this work with similar research of the department. As

director of research, he will coöperate with the bureaus in planning and coördinating their research work. As a third function, he will have general administration of a Special Research Fund made available by the Bankhead-Jones Act, approved June 29, 1935, including the planning and coördination of the research program of the department under this fund.

W. F. Sulzbacher, Chillicothe, Ohio, has donated to the AMERICAN PHARMACEUTICAL ASSOCIATION a large number of volumes of pharmaceutical publications. The donation completes several sets now in the Library.

Miss Minnie Meyer, Madison, Wis., national secretary of Kappa Epsilon, recently was honored with a Ph.D. degree. Miss Meyer previously held degrees of B.S. and M.S. She is a member also of Rho Chi, Sigma Delta Upsilon, Sigma Xi and Phi Beta Kappa. Recently she was placed in charge of the pharmaceutical library at the College of Pharmacy, University of Minnesota; formerly she was research assistant there. Miss Meyer is a graduate of the Oshkosh Teachers College of Oshkosh, Wis.

F. G. Fricke, member of the AMERICAN PHARMACEUTICAL ASSOCIATION, since 1903, a veteran pharmacist of Plattsmouth, Nebraska, has recently celebrated his 90th birthday. The occasion was made an event of his home city and state. He is in good health and continues quite active in his work and comes to his pharmacy every day.

Surgeon General Parran is president-elect of the American Public Health Association. In 1935 he was chairman of the American delegation to the International Congress of Dermatology and Syphilis in Budapest. He is the sixth surgeon general of the U. S. Public Health Service and the first who has served as state health officer prior to becoming surgeon general.

The Memphis Drug Club has voted to establish permanent clubrooms at the University Center to be dedicated to the late **E. V. Sheely.**

Dean H. B. Lewis, University of Michigan College of Pharmacy, was reëlected president of the American Society of Biological Chemists. He delivered the annual Sigma Xi address at the initiation banquet of the Yale chapter. The subject of the address was "The Chemist Looks at Biology."

Secretary E. F. Kelly, A. PH. A., was one of the speakers at Kansas Pharmaceutical Association.

A testimonial banquet to be held in honor of **Dean W. Henry Rivard** who has actively served the Rhode Island College of Pharmacy and Allied Sciences for twenty-five years was tendered April 29th at the Narragansett Hotel, in Providence.

UNIVERSITY OF FLORIDA EXTENSION DIVISION.

A Short Course for Pharmacists was held at the University of Florida, Monday, Tuesday and Wednesday, April 20th, 21st, 22nd. All sessions of the instructional program were held at the American Legion Home, 610 East University Avenue, Gainesville. This course was conducted by the General Extension Division in coöperation with the School of Pharmacy, College of Arts and Sciences, and assisted by the Florida State Pharmaceutical Association.

The purpose of the Short Course is to give an opportunity for practicing pharmacists to come together, under the direction of the faculty of the School of Pharmacy of the University and other men who are specialists in the various fields of pharmacy operation, to study their current problems. The course deals with the business management as well as with the technical phases of a pharmacy.

PURDUE UNIVERSITY BUSINESS CONFERENCE.

The sixth annual business conference sponsored by Purdue University was well attended. The registration and interest increases each year. The banquet was attended by approximately 400. President Elliott was the toastmaster and introduced Dr. Fishbein, the speaker of the evening. President Elliott's wisdom and satire plus the repartee of Dr. Fishbein were thoroughly enjoyed, he traced the development of the medical profession from the earlier stages in a very entertaining manner. He spoke of the trend to state medicine and pointed to many of its weaknesses and compared the three and one-half billions spent for medical care with that spent for other necessities and luxuries which he said totaled 1110 billion dollars annually.

Dr. Howard W. Haggard was the speaker on the second evening at a joint meeting of the druggists' conference and the delegates to a district meeting of State Boards and Colleges of Pharmacy. His subject was "Medical Fads and Superstitions."—*Indiana Pharmacist.*

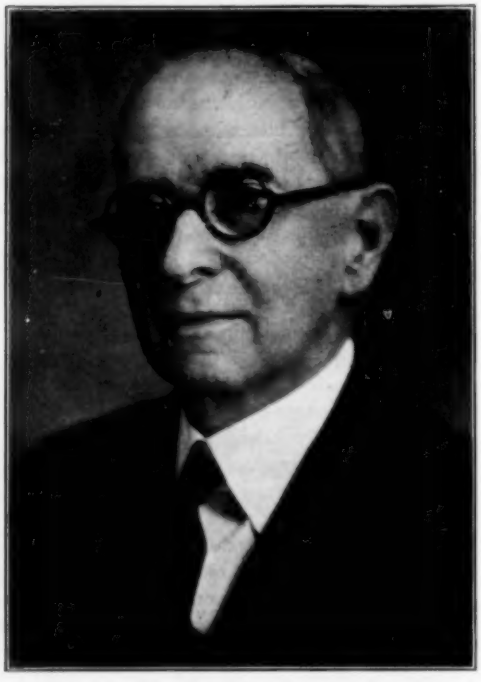
The 84th Annual Meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION will be held in Dallas, Texas, August 24–29, 1936. Hotel Adolphus, Headquarters.

OBITUARY.

JOHN URI LLOYD.

John Uri Lloyd, member of the AMERICAN PHARMACEUTICAL ASSOCIATION, since 1870, and its president in 1877–1878, died at Van Nuys, Calif., a suburb of Los Angeles, April 9th, while on a visit to a daughter, the wife of Dr. O. C. Welbourn.

The funeral ceremonies were held in Calvary Episcopal Church in Cincinnati, and the burial services at Hopeful Cemetery, Florence, Ky., the little community made famous by his book "Stringtown on the Pike."



JOHN URI LLOYD.

J. U. Lloyd was born in West Bloomfield, N. Y., April 19, 1849, a son of Nelson Marvin and Sophia Webster Lloyd, descendants of early New England stock. In 1853 the family moved to Kentucky, residing in Burlington, Petersburg, Florence and Crittenden, prompted by the opportunities for securing educational work; both father and mother were of liberal education and taught in the schools of this section of Kentucky. The youth received rudimentary education in the one-room school house of that period; his parents led him to think, observe and study for himself.

Because of a special interest in chemistry it was decided that he should study pharmacy, and he was apprenticed to W. J. M. Gordon of Cincinnati; and his second apprenticeship was with George Eger.[1] During this time the young man attended the chemistry lectures of Dr. Roberts Bartholow at the Ohio Medical College and, later, a course in Anatomy at the Miami Medical College, under Dr. Clendenin. Later, he engaged with H. M. Merrell Company; by successive changes this firm became Lloyd Brothers, Inc.—the brothers being John Uri, Nelson Ashley and Curtis Gates.

The activities of Professor Lloyd were early directed to the study of plant life and materia medica, stimulated by close association with Dr. John King and Dr. John M. Scudder. Although deeply engaged in laboratory work and in developing the manufacturing business which had been established, he found time to occupy the chair of Chemistry and Pharmacy in the Eclectic Medical Institute. He taught for four years in the Cincinnati College of Pharmacy and for a time was professor of Chemistry.

He was president of the Eclectic Medical Institute; editor of the *Pharmaceutical Review*, of the *Eclectic Medical Journal* and the *Eclectic Medical Gleaner*, and a continuous contributor to pharmaceutical and medical publications. Among his writings are "Chemistry of Medicine;" "Drugs and Medicines of North America;" "American Dispensatory," in several editions; "Elixirs, Their History and Preparation."

He especially investigated plant chemistry and phytochemistry, alkaloids, glucosides and proximate principles, precipitates in fluidextracts, phenomena of capilarity. The introduction of the contributions of "Solvents in Pharmacy," published in the JOURNAL A. PH. A. in 1917, explains the connection of the later articles with those printed in the PROCEEDINGS of 1879–1885. Dr. W. Ostwald recognized the work "as the foundation of colloidal chemistry." In a sketch of one whose activities have touched upon so many phases of research in science, history and literature, it is impossible to present a complete account; at any rate, much that is to be said must be deferred.

In 1895 he published "Etidorhpa," which won him fame as a writer. Then followed quickly "The Right Side of the Car," in 1897;

[1] JOUR. A. PH. A., 4, 1342 (1915).

"Stringtown on the Pike," in 1900; "Warwick of the Knobs," in 1901; "Red Head," in 1903; "Scroggins," in 1904; "Felix Moses, the Beloved Jew," in 1930; and "Our Willie," in 1934. He was a guest at the notable Mark Twain birthday celebration, attended by the elite among writers.

Professor Lloyd was honored on three occasions with the Ebert Prize and in 1920 he received the Remington Honor Medal. A number of educational institutions conferred upon him honorary degrees. He received the "Master of Pharmacy" from the Philadelphia Col-

JOHN URI LLOYD, in his study.

lege of Pharmacy; the Cincinnati College of Pharmacy made him a "Doctor of Pharmacy;" the University of Cincinnati, "Doctor of Science;" Ohio State University, "Doctor of Philosophy;" Wilberforce, "Doctor of Laws;" Cincinnati Eclectic Medical College, "Doctor of Medicine" and other honors and distinctions.

Professor Lloyd was twice married—in 1876 to Miss Adeline Meader, of Cincinnati, and Miss Emma Rouse of Crittenden, Ky., in 1880; the latter died November 28, 1932. Shortly before her death, in August 1932, Mrs. Lloyd completed "Clasping Hands with Generations Past" for presentation to her relatives and descendants, a comprehensive and interesting genealogical record of the families. The surviving children of the family are: Dr. John Thomas Lloyd, Mrs. Dorothy Brett, of Hyde Park, Mrs. O. C. Welbourn, of near Los Angeles.

In September of last year Professor Lloyd visited Japan; he returned safe and well and, recently, made the journey to California without great inconvenience.

There are many outstanding successes that can only be mentioned; in research, adsorption, extraction of drugs, physics, literature, and the establishment of the Lloyd Library.

He was an honorary member of many civic, patriotic, professional and scientific societies, clubs and associations.

The birthday of the deceased is celebrated annually in Cincinnati by groups of friends and associates. The Veteran Druggists' Association has been referred to in the editorial columns; daily, his employees greeted him, the Library welcomed the founder and until the small hours of the night, often, the comrades, Frank Shaffer and A. J. Conroy, were with him; he was beloved by his family, to whom we extend our sympathy.

The diversity of his gifts made him a notable figure; he was famous for his discoveries; his kindly wisdom is part of *our* heritage.

Charles G. Merrell, Frank H. Freericks and Dr. James H. Beal were appointed representatives by the AMERICAN PHARMACEUTICAL ASSOCIATION for the memorial services.

"John Uri Lloyd now has reached his 'Unknown Country' and to-day he knows the answers to the mystic questions he propounded many years ago in 'Etidorhpa.'"

RESOLUTIONS ON THE DEATH OF WILLIAM VOTTELER.

William Votteler was called by death on November 22, 1935, after a short illness. His passing was a severe shock to the druggists of Kentucky.

By his life-time devotion to the cause of Pharmacy in Kentucky, he had endeared himself to the druggists of the state for his kindly assistance; for his high ideals; the soundness of his judgment and by his tireless and unwavering efforts for the benefit of his profession.

He served two 5-year terms as a member of the Kentucky Board of Pharmacy—from 1917 to 1922 and from 1924 to 1929. After the expiration of his second term he accepted the position of State Drug Inspector which he filled with eminent satisfaction until his death.

In recognition of a deep sense of loss, the Board of Pharmacy adopts the following resolution:

Resolved, That by the death of William Votteler, the Board has lost a wise counselor, a tireless worker, a kindly, loyal and devoted friend, and

Resolved, That as an expression of abiding appreciation and affection, this resolution be entered upon the records of the Board, a copy thereof be furnished the Editor of the *Journal of the Kentucky Pharmaceutical Association* and a copy be sent to his bereaved family.

Linwood A. Brown, *President*
Albert E. Ely
Frank H. Patterson
James F. Wilson
Arthur P. Markendorf.
ATTEST:
J. W. Gayle, *Secretary*.

The deceased became a member of the AMERICAN PHARMACEUTICAL ASSOCIATION in 1895.

MRS. JOSIE A. WANOUS STUART.

The death of Mrs. Josie A. Wanous Stuart is reported. She was a member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1897. She graduated in pharmacy in 1890 and operated her own pharmacies in Minneapolis from 1896 to 1909.

Mrs. Stuart was the first woman pharmacist in Minnesota. In 1901, she entered the manufacturing business in which she made a success. She had been a vice-president of the AMERICAN PHARMACEUTICAL ASSOCIATION. She was a member of the Minnesota Pharmaceutical Association and of the Veteran Druggists' Associations of St. Paul and Minneapolis.

HENRY E. WRENSCH.

Henry E. Wrensch, Glen Ridge, N. J., member of the AMERICAN PHARMACEUTICAL ASSOCIATION since 1902 and life member of the New Jersey Pharmaceutical Association, died at his home February 17th.

Born in Montclair in 1873, Mr. Wrensch conducted a drug store on Bloomfield Ave. until he retired fifteen years ago when he moved to Glen Ridge. Mr. Wrensch had been in ill health for two years prior to his death. He was a trustee of the New Jersey College of Pharmacy and is survived by his widow, Emilie C. Wrensch.

A. M. LICHTENSTEIN.

Albert Moses Lichtenstein, pharmacist at Cumberland, Md., for more than forty years, died suddenly at his home March 17th, aged sixty-six years. He was a native of Cumberland and is survived by his widow.

Mr. Lichtenstein was an alumnus of the Maryland University School of Pharmacy and after graduation engaged in the drug business at Cumberland. He was deeply interested in the progress of the AMERICAN PHARMACEUTICAL ASSOCIATION and on several occasions contributed items of historical value to the museum.

The deceased was prominent in business circles and interested in the advancement of the community and was highly regarded by his co-workers.

EXHIBITS AT THE AMERICAN INSTITUTE OF PHARMACY.

During the meeting of the Pan-American Association of Health Officers the following were shown: Early Plates of the Sarsaparilla (*Smilex Medicus*) Illustrating Bravo's Lengthy Discussion of Its Usage.

The Badianus Manuscript.—The earliest Pharmacopœia in America. It is the work of the two Aztec Indians who were taught to write Aztec and Latin in the College of Santa Cruz. The text was translated into Latin by Juan Badianus in the year 1552. It is the only medical text dealing with native medicine written by the Aztecs themselves, which has yet been discovered.

Photostats and colored plates were loaned by the Smithsonian Institution.

Libro Del Judio.—A 16th century medical text in the Mayan language. This is a copy of an earlier unknown manuscript, referred to as Manuscript X. The "Libro del Judio" came to light in Acanceh, Yucatan. The original is in the Peabody Museum, Harvard University. This photostat copy was loaned by the Peabody Museum.

Libro Que Trata De Las Cosas Que Traen De Las Indias Occidentales, etc., 1565.—This is the rare first edition of the Monardes by Dr. Nicholas Monardes, physician of Seville, whose four volumes on medicine of the Occidental Indies are largely responsible for the introduction of early Latin-American medicine into Europe. His writings were translated into English, Latin, Italian, French and German.—Loaned by the Surgeon General's Office Library.

SOCIETIES AND COLLEGES.

A. PH. A. CONVENTION PLANS.

The committee on arrangements for the convention of the AMERICAN PHARMACEUTICAL ASSOCIATION, to be held from August 24th to 28th, met in Dallas to make extensive convention plans. The following attended: M. H. White, Walter D. Adams, H. C. Burroughs, Tom A. Harris, E. C. Harrell, Walter Cousins and W. E. Hill. Mr. Harrell is general chairman of the arrangements committee. Walter D. Adams is local secretary.

DOCTORS, DRUGGISTS AND NURSES.

The first joint meeting of the allied health professions of Dade County, Florida, comprising the Dade County Medical Association, Dental Association, Nurses League and Retail Druggists' Association, met in Miami, April 3rd. Dr. John E. Hall, president of the Medical Society, presided; about six hundred persons attended the meeting.

Interprofessional relations and legislation on matters of general health were among the important points under consideration.

ANNIVERSARIES.

This is the Golden Jubilee Year of Northern Ohio Druggists' Association.

South Dakota Pharmaceutical Association will hold its Golden Jubilee Meeting in Sioux Falls, May 4th–8th. A former president of the AMERICAN PHARMACEUTICAL ASSOCIATION, D. F. Jones, of Watertown, is also a former president of South Dakota Pharmaceutical Association.

MISSOURI PHARMACEUTICAL ASSOCIATION.

The Missouri Pharmaceutical Association held a most successful meeting in St. Joseph, April 21st–23rd. An important topic of the convention was the question of price stabilization.

OKLAHOMA PHARMACEUTICAL ASSOCIATION.

The City of Enid will entertain a large gathering of Oklahoma Druggists, May 5th–7th. Pharmacy Hour will be under the direction of Dean D. B. R. Johnson; Dr. Loyd E. Harris of the University of Oklahoma School of Pharmacy will speak on N. F. and U. S. P. matters.

The Veteran Druggists of Oklahoma will form an association and the Oklahoma Graduate Association will take an active part in the meeting. Walter Cousins, Dallas, Texas, will be "Toast Master" for the banquet this year.

The convention at each session will devote more time than ever before to Round Table discussions and there is much to discuss.

SOUTH DAKOTA GOLDEN ANNIVERSARY.

In celebration of its Golden Anniversary, the South Dakota State Pharmaceutical Association has arranged for a big meeting.

This great event will take place at Sioux Falls, May 4th to 8th, and each and every retail druggist of the Great Northwest is urged to attend. The meeting will be open to members of the South Dakota State Medical Society, the South Dakota Dental Society, the South Dakota Hospital Association, the South Dakota Nurses Association and the South Dakota Veterinary Association, all of which are represented on the program. Headquarters are to be at the Cataract Hotel.

An effort will be made to effect a permanent organization of the allied groups named and a combined program is scheduled for the second business day, Wednesday, May 6th. Secretary E. F. Kelly and R. L. Swain, former president of the A. PH. A., are among the guest speakers.

An old druggist's prescription file, started in 1869, and a set of French apothecary or metric weights found recently in the basement of the Brecht drug store at Yankton may shed some light on early South Dakota history.

A set of apothecary weights, so ancient they may have been left there by the Lewis and Clark Expedition in 1804, were discovered while searching in the basement of the store for the prescription file.

The relics were found when Dean E. R. Serles, of the pharmacy division of State college, scheduled to address the Semi-Centennial convention of the Pharmaceutical association in Sioux Falls, May 5th, 6th and 7th, on the history of pharmacy in South Dakota, requested P. A. Brecht, owner of the store, to send some proof of its antiquity. Mr. Brecht's father, Dr. F. A. Brecht, acquired the store from its original owners, Mills and Purdy, in 1869. A son of P. A. Brecht, Fred, is a sophomore pharmacy student at State college.

KANSAS PHARMACEUTICAL ASSOCIATION.

At its annual convention in Topeka, the Kansas Pharmaceutical Association voted to join forces with the Allied Business Men of Kansas to present a fair trade bill, at the next session of the Kansas Legislature. Sentiment in favor of a fair trade law for Kansas ran high at the druggists' meeting which was attended by 867 members of the retail drug trade, doubling the attendance of last year's convention.

The huge increase in attendance at this year's convention was attributed to the functioning of the captain plan in this state, and to the greater interest on the part of druggists in their merchandising problems, which were discussed at the convention. Secretary E. F. Kelly, A. PH. A., was one of the speakers.

Percy S. Walker, of Topeka, was elected president for the ensuing year. Other officers elected are Paul Schulz, Beloit, first vice-president; C. J. Arbuthnot, Lebanon, second vice-president; Blaine Miller, Salina, treasurer; L. D. Havenhill, dean of the State School of Pharmacy, Lawrence, librarian; W. M. Newmark, of Topeka, is secretary of the association.

The convention instructed the legislative committee of the association to prepare a bill for presentation at the next Legislature asking for a new building at the State School of Pharmacy at the University of Kansas, to care for the rapidly growing enrollment. The legislative committee also will ask for a law placing the percentage of butter fat and weight of ice cream sold in original container.

It was announced that an emblem to be used by accredited Kansas drug stores compounding prescriptions is being designed. In view of the fact that the present itinerant vendor bill is incomplete, that measure will be rewritten.

An interesting and most valuable presentation was that of the comprehensive history and biographical sketches of Kansas pharmacists by Mathias Noll, veteran member of the association.

The association voted to hold its 1937 convention in Wichita.—From *Drug Topics*.

PROPRIETARY ASSOCIATION.

Representatives of twenty trade associations in the drug and allied fields have been invited by Frank A. Blair, president of the Proprietary Association, to attend the 54th annual convention of that body to be held in the Hotel Biltmore, New York City, on May 14th and 15th. Department sessions will be held on the 13th.

SILVER ANNIVERSARY, AMERICAN DRUG MANUFACTURERS' ASSOCIATION.

The meeting of the American Drug Manufacturers' Association is their silver anniversary, to be held in White Sulphur Springs, W. Va., May 4th–7th.

S. 4390—A BILL TO AMEND THE NATIONAL DEFENSE ACT RELATING TO THE MEDICAL ADMINISTRATIVE CORPS.

Senator Morris Sheppard introduced the above titled bill in the Senate on March 30th. Its provisions and purposes are stated in the following:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That Section 151, Chapter 7, Title 10, of the United States Code of Laws (1934 edition), is hereby amended by striking out the period at the end of said section and adding the following—": *Provided*, That on and after the effective date of this Act further appointments to the Medical Administrative Corps shall be restricted to pharmacists who are graduates of recognized schools or colleges of pharmacy requiring four years of instruction for graduation, such appointments shall be made in the grade of second lieutenant under such regulations and after such examination as the Secretary of War shall prescribe: *And provided further*, That the number of such pharmacists in the Medical Administrative Corps shall not exceed sixteen."

The bill was read twice and referred to the Committee on Military Affairs.

The bill will be somewhat amended but will not change the purpose and effort. Senator Sheppard is greatly interested and also the Surgeon General of the Army. The amended bill has been approved by both and it is hoped to pass the amended bill with, perhaps, minor changes.

The bill was reported in Senate, April 24th. Reported favorably by the Committee on Military Affairs, April 28th—Report No. 1942.

KENTUCKY PHARMACY BILL.

The Kentucky pharmacists failed to have their new pharmacy bill enacted into law. The proposed measure would have been an improvement on present legislation.

Committees, Sections and Conferences should begin to arrange programs for the Dallas Meeting.